JUL 7 1934

FOOD INDUSTRIES

THE NEWS OF • PRODUCTION • ENGINEERING • DISTRIBUTION

BAKERY PRODUCTS

BEVERAGES

CANNED AND PRESERVED FOODS

CONFECTIONERY AND CHOCOLATE

DAIRY PRODUCTS AND ICE CREAM

FATS AND OILS

FLOUR AND CEREAL PRODUCTS

MEATS AND MEAT PRODUCTS

OTHER FOODS AND SPECIALTIES

JULY 1934

McGRAW-HILL PUBLISHING COMPANY, INC.

HIGHER PRICES COMING

Ultimate effects of the drought will not be apparent until late this year.

Hay and forage crops, although only indirect sources of many food raw materials, provide the principal key to the situation. The general pattern of the American menu may change materially with advancing meat prices.

European weather, also adverse to agricultural productivity, contributes its promise of disappearance of burdensome world surpluses.

Acute shortages are not probable, but higher prices for most foods are inevitable.

KEEPS FOOD HANDLING SURFACES

MICRO-CLEAN*

●

...LOW COST insurance against product SPOILAGE

HTH is a highly concentrated calcium hypochlorite for making germicidal solutions, either alone or in combination with soda base. HTH is packed in 4-lb. cans, one dozen to the case. Each can makes 30 gallons of a concentrated supply solution containing 1% of available chlorine.

LET bacteria find a single loophole in your defenses against spoilage and almost overnight years of good will can be torn down.

Moreover, there's no telling how high your actual money losses may run if bacterial contamination makes it necessary to discard or re-process . . . or to replace unsaleable goods.

Leading food manufacturers find that the one sure way to overcome the threat of damaged goods and damaged reputations is to keep surfaces Micro-Clean* with HTH.

Safe to Use

HTH is a concentrated powder for making chlorine sterilizing solutions—the only kind of a bactericide and fungicide (except steam) that's approved by health authorities for use on food equipment.

Unlike steam, HTH solutions cause no expansion strains...leave no living bacteria behind due to rapid condensation . . . present no danger of scalding . . . lead to no added dampness around the plant.

Economical

One 4-lb. can of HTH makes 3000 gallons of germ-killing solution containing 100 parts per million available chlorine. This provides a non-poisonous rinse that leaves no objectionable odor.

And the cost of HTH is trifling when you consider the dollar value of the protection it affords. For low cost quality insurance, order a trial case of 1 dozen 4-lb. cans of HTH from your supply house...today.

The MATHIESON ALKALI WORKS (Inc.)
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Soda Ash . . . Liquid Chlorine . . . Bicarbonate of Soda HTH and HTH-15 . . . Caustic Soda . . . Bleaching Powder Ammonia, Anhydrous and Aqua . . . PH-Plus (Fused Alkali) . . . Solid Carbon Dioxide.

HTH sanitation is steadily becoming the standard practice with these producers of food products:

Bakeries	**Distilleries**
Bottling Plants	**Fish Packing Plants**
Breweries	**Ice Plants**
Canneries	**Ice Cream Plants**
Cheese Plants	**Meat Plants**
Creameries	**Milk Plants**

*Micro-Clean means free from harmful bacteria, as shown by a microscope.

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FOOD INDUSTRIES

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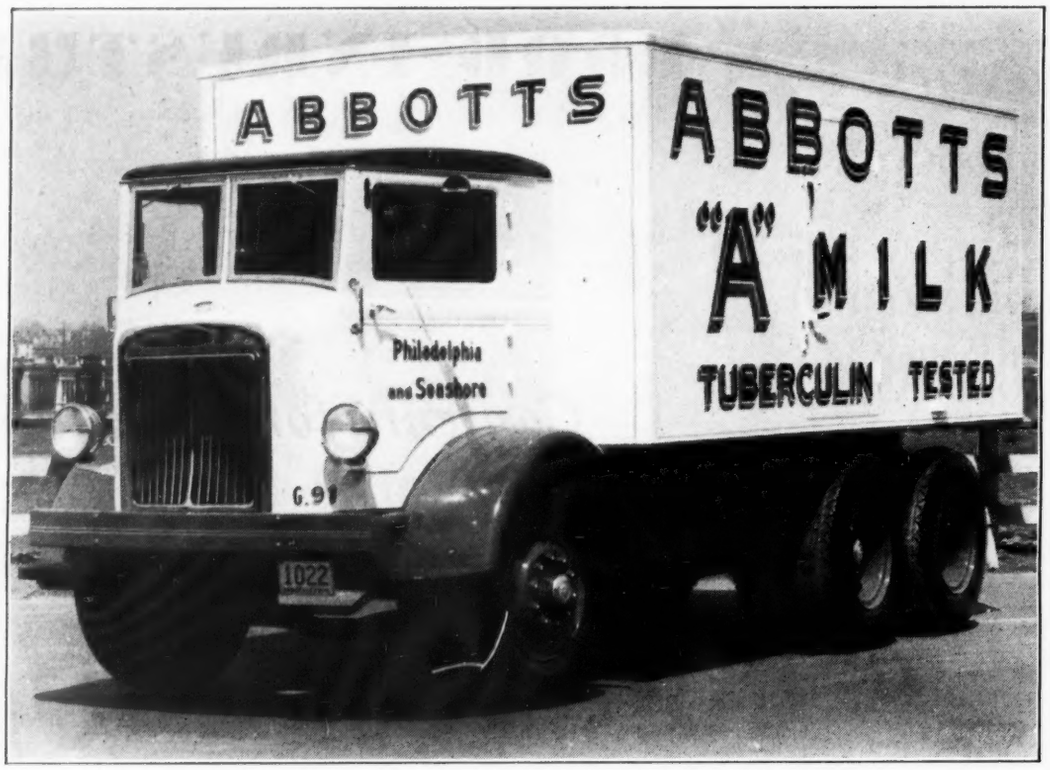


AUTOCAR TRUCKS ARE MASTERS OF ROADS, LOADS AND LAWS

A Conventional Model
Parallels Every Engine Under-the-Seat Autocar

The profit-value of some motor trucks is constantly restricted by roads, loads or laws. The inability of a truck to conquer *any* of these obstacles reduces that truck's value below the profit line.

This is *never* the case with Autocars.

Hundreds of miles of long, hard roads, with stiff grades all the way, are successfully conquered by Autocar's Blue Streak engines, and Autocar's unexcelled transmissions and rear axles.

When maximum loads are demanded by the profit necessities of any haul, Autocar's bigger, sturdier construction—designed to do a job, not to meet a price—comes to the owner's rescue and takes that pay load without telling strain.

Engine-under-the-Seat Autocars are available to carry profitable loads into any state whose laws restrict over-all length or axle load, or both.

In the food industry, where long hauls are not unusual, roads, loads, and laws can *all* be allied against the ordinary motor truck, but you can depend upon *one* manufacturer to give you trucks that are masters of *all* roads, *all* loads and *all* laws.

AUTOCAR TRUCKS

THE AUTOCAR COMPANY, ARDMORE, PA.

FOOD INDUSTRIES

THE NEWS OF • PRODUCTION • ENGINEERING • DISTRIBUTION

Established 1928—McGraw-Hill Publishing Company, Inc.
Volume 6 Number 7

New York, July, 1934 . . . Laurence V. Burton, Editor

Defective Plans of the "Planners"

TO EVALUATE or criticize the first year of N.R.A. requires also a consideration of its companion measure, A.A.A., for one affects the other. From a national viewpoint the same two defects in a technical sense, as contrasted to the political policy involved, are still very apparent.

● If we have not discussed them in these pages before it is because we expected that statesmenlike minds in Washington would have discovered and remedied them a year ago. The continued existence of such defects, however, in our opinion, constitutes a serious indictment of the intelligence and ability of the "New Deal" economic planners.

● The first of these is the fundamental conflict of the objectives of N.R.A. and A.A.A. Parity prices for farm products can never be attained under the present set-up. And if this conflict of objectives is allowed to continue indefinitely, the upward jiggle of prices of the products of industry, cost of living, prices of farm products, wages and the like will reach an untenable height and topple over. Your guess is as good as ours as to when the limit will be reached.

● It is apparent to us that most of the industrial strife of the past few months would have been inevitable sooner or later even without the ambiguities of famous Sec. 7 (a) of N.I.R.A. Such an outcome is bound to occur from their conflict of objectives.

● The second defect is the lack of what we choose to term an expansion joint in N.R.A. —to borrow an engineering term. Wages and hours of labor are fixed in most of the industries today, a pair of conditions that makes for higher costs and necessitates higher prices if payment is to be made out of the proceeds of goods sold. Otherwise, it must come from reserves or loans.

● Higher prices can be obtained if people will pay them. But there is no power on earth to *make* people buy.

● In both of these cases we are dealing with fundamental human characteristics, and the issue cannot be evaded more than temporarily. No outcome other than strife and dissatisfaction can come from such incompetent foresight.

● Too much of the thinking in Washington has centered about those industries which on the material side are completely subject to the will of management, such as steel. From digging the ore and coal to the final fabrication, steel is beholden only to the desires of men. No necessity exists that will compel that industry to reckon with or gamble on weather. Nor are there, in the general sense, any substitutes for steel.

● In contrast to such an industry, susceptible to the will of man, are the food industries. Not only are they all dependent on the vagaries of nature for primary raw materials but the products of the food industries are nearly all mutually capable of substitution one for another. Furthermore, the food industries deal in perishables and semi-perishables which *must* be sold, sometimes at salvage prices, to avoid total losses.

● Any reasoning based on the experience of the heavy industries cannot be applied indiscriminately to the food industries, yet N.R.A. seems to be singularly free from men who understand perishables.

● Before N.R.A. has a ghost of a show for enduring value, the parity price mandate of A.A.A. must be replaced by something that does not, like the rainbow, forever recede into the distance. Also wage and hour specifications under N.R.A. must be given the expansion joint that will permit those industries to adapt themselves to things as they actually are—not as someone thinks they are. Natural economic relationships cannot be indefinitely distorted.

● A new deal in the "New Deal" is definitely needed.

AS IT LOOKS TO US

Your Vote, Please . . .

Readers are requested to register their desires regarding the Patent Digest. This department has been omitted several months. If it is your desire to see this department continued as a regular monthly feature of FOOD INDUSTRIES, please write a note to the editor. It will take 200 votes to get it reinstated.

Farmer Tugwell . . .

Those who have seen pictures of the sartorially perfect new Under-Secretary of Agriculture, seated before the Senate Committee on Agriculture and Forestry, during the recent ludicrous "examination" of the candidate, could not fail to notice the contrast between the cool, immaculate, urbane gentleman from New York, clad in white linen, and the perspiring gentlemen on the committee, most of whom came from the hinterlands.

The majority of the members of the Senate are sincere, genial, but rather simple-minded men, who would not think of conducting, without the aid of an astute lawyer, an inquiry into the life and habits of a financier from downtown New York. But an economic visionary from uptown New York is a horse of another color. The Senators, feeling more at home on matters agricultural than on matters financial, were emboldened to the point of conducting their own "inquiry" into the fitness of Professor Tugwell without any outside aid. Little did they realize that they were dealing with a man who was just as smart as any denizen of the canyons of the financal district and a whole lot smarter than the Senators themselves.

Although we are opposed to Professor Tugwell and do not share his views, we cannot but marvel at his cheek; the cool, polite insolence of some of his explanations that did not explain. How he must have laughed up his sleeve at the inept, almost juvenile attempts to question him! The ease with which he put the President between himself and his interrogators was too much for the Senators. They dared not discredit the President's program, yet to attack Professor Tugwell that would have been necessary.

A lawyer-economist should have been engaged to do the examining if the committee had any real intention of inquiring into the workings of the mind of the man who is growing increasingly in influence in the government and who, like General Johnson, is impervious to all criticism.

Yet in spite of the senatorial farce and low comedy of the incident, Professor Tugwell did not or could not conceal a curious chameleon-like character. In the days to come, however, it may come to pass that he will regret the character rôle he portrayed at the hearing. Events, not individuals, will eliminate Professor Tugwell.

What Does This Mean?

A decline of volume amounting to 6 per cent a year since 1926 is reported to have occurred in sales of baking powder. Statistics of this sort are extremely difficult to gather, but these figures seem to be fairly accurate.

Part of the decline can be accounted for by the increase of consumption of prepared baking mixtures in which the chemical components of baking powder are purchased separately and incorporated in the flour. But where has the rest of the volume gone? Anybody know?

Cartons vs. Baskets . . .

Although the Department of Agriculture believes it would be a backward step for any action to be taken by Congress which could be construed as abandoning the principle of container standardization, it reluctantly admits that the Standard Container Act of 1916 must be rationalized for the benefit of the mushroom growers and basket makers.

It is "just one of those things," and requires an act of Congress and Presidential signature to correct an absurd situation. In brief, the trouble is that at present it is "agin the law" to sell a pound of mushrooms in a basket, but it is perfectly legal to do it in a cardboard container.

A pound of mushrooms, the customary unit of sale, will occupy a space equivalent to 1⅓ quarts. But a basket holding 1⅓ quarts is illegal. And so Senate bill 1182 amends the Standard Container Act to placate the makers of Climax baskets and the mushroom growers.

What Are They For?

The production manager of a concern making a prepared baking mixture admits he is not a good cook in a domestic kitchen, but he was dissatisfied with the consumer directions that were printed on the package. After a few stealthily conducted, disastrous attempts to follow them literally, he recently bet the president a dollar that the Big Boss could not make a batch of goods by following directions. The Boss, of course, could not refuse the bet. He lost.

Nobody could literally follow directions and get the expected results, because the directions were aimed at expert cooks who don't need directions. The novice would be lost.

All of which brings up the query regarding "Directions for Making." For whom are they written? Are they for the advertising department or for expert cooks? Or are they just something to fill up space on a carton?

Drought Situation Clearer

Despite June rains in the drought areas, it is apparent that the damage has been done, now that the situation is becoming slightly more clearly defined. Many, however, will fail to realize the extent of the damage until several months has elapsed.

In addition to the survey presented in this issue, there are a few other observations and predictions that management will consider. For example, butter production in Land O'Lakes creameries in the year beginning June 1, it is estimated, will be about 15 per cent less than the year before. The corresponding production loss to the whole butter industry will be about 200,000,000 lb. The butter loss due to drought figures out

about 1½ lb. per capita for the year.

Reestimates of probable grain production continue downward. One unofficial observer declares that the Dakotas cannot sell a bushel of grain this year, and adds that North Dakota, which in 1933 stood twelfth in volume of dairy products, will be at the bottom in 1934 *and 1935!*

Acute food shortage probably will not develop, except locally. No large-area regional famines are anticipated. But those executives who are cultivating foresight will interpret the trend of events correctly and profit thereby.

Life in the Old Law, Yet

A press release dated June 12 shows that the Food and Drug Administration has made 136 seizures—a very commendable activity. All of which directs our attention to the fact that the Food and Drug Administration is left in something of an awkward predicament by the adjournment of Congress without enacting the revised Food and Drug and Cosmetics Law.

Ardent pleas before the Senate Committee on Commerce that a new law was a necessity left the general impression that the old law was wholly ineffectual. Yet here is evidence that there is still plenty of life in the act of 1906.

If the Food and Drug Administration does a thorough job with the legal instrument now available before the next Congress meets, the result is likely to be a weapon in the hands of the opponents of further legislation, and the apparent need for a new law will be much weakened. On the other hand, the Food and Drug Administration cannot afford to take things easy, lest it open the way for abusive flank attacks from the self-appointed representatives of the consumer.

Outside of a few specific matters, like its failure to embrace cosmetics, the weakness of the old law has not been so much its legal defects as it has been lack of proper appropriations with which to enforce it. In the opinion of FOOD INDUSTRIES there is enough authority in the old law to make it plenty hot for many, provided that Congress chooses to provide the money with which to operate.

We hasten to add, however, that the money problem will not be solved by enactment of a new law patterned after the Copeland Bill S. 2800. True, the original Tugwell Bill S. 1944, would have made the matter of inadequate appropriations a minor obstacle to enforcement, for, by that masterpiece of sly legislative writing, industry would have been maneuvered into the position of financing a great deal of the regulatory work.

Legislation by the Executive

When the canning industry code was finally approved by the President, the canners were astonished to discover in the approved code some "pure surplusage"—to borrow a term that the President has used before. He had insisted on including the requirement that "the industry shall designate a committee whose membership shall be subject to the approval of the Administrator and who shall cooperate with the Administrator in the formulation of standards of quality for products of the industry and to make recommendations to the Administrator within ninety (90) days for the inclusion in said Code of provisions with respect to such standards and labeling requirements."

Thus the President by executive action exercises the equivalent of a legislative function. Seemingly the Administration thus takes steps which hitherto have not been deemed to be within the authority of the federal government, and without awaiting legislation which Congress thus far has refused to enact.

Standards of quality are important. But it is highly improper for the issue to be forced by a questionable executive procedure.

That the canning industry did not toss the whole affair back at the Administration is an example of remarkable forbearance. The ability of the industry to hold its temper under the circumstances is a truly admirable achievement and it deserves a compliment, although we are not sure that the industry has gained anything by meek compliance. It may be only an order to make recommendations, but it looks very much as if the camel has his head in the Arab's tent.

Fixing national standards of quality for canned foods is peculiarly difficult. Only to those whose viewpoint is limited to a single region or whose ignorance of the subject is abysmal does it appear to be as simple as printing A, B or C on a label. It is, therefore, most unfortunate that the President has chosen this particular place at which to enter on an enforced system of federal standards.

Industries Without Codes

An interesting feature of the recent N.R.A. announcement of pricing policy shuts off industries which have not yet received their codes from the pricing advantages which are contained in existing codes. It should have a most salutary effect in getting those uncoded industries to accept the offer (which remains still open) to come under existing related codes. This may be part of the strategy of N.R.A. in blazing forth with the stop order on generous pricing provisions in new codes.

Inquiry . . .

What are the food uses of milk albumen? This inquiry comes from one of our subscribers. Milk albumen, known chemically as lactalbumen, is not to be confused with casein. We confess that we are unable to assist him. Can anyone help?

Tennessee Valley Authority

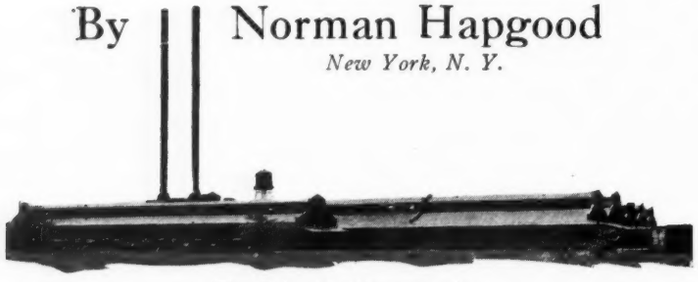
Developments in the Tennessee Valley Authority have been carefully watched by FOOD INDUSTRIES to determine what, if anything, this development would mean to food processors in the United States. Outside of its social implications, whereby the ideas of President Roosevelt are to be made avaliable to the population of that area (at national expense), there has been, up to now, little of interest to manufacturers of foods.

However, if T.V.A. succeeds in attracting or developing any large heavy industries through its cheap power, there will develop simultaneously a sizable market for processed foods. But to take advantage of that new market one must reckon with the T.V.A. Board. Its plan is to make the regional enterprise as nearly self-sufficient as possible, and it expects that food processing shall be based on local raw materials in so far as is practical.

As far as we can ascertain, the principal foodstuffs available locally, in quantities approximately sufficient for commercial processing, are strawberries, blackberries, raspberries, carrots, sweet corn, spinach, asparagus, sweet potatoes, green beans. Not a whole lot, to be sure, but a start.

Employees See the Balance Sheet *Every Week*

By Norman Hapgood
New York, N. Y.



The Columbia Conserve Co.

IN nearly every branch of industry is found at least one concern the social policy of which is far in advance of the times. Believing that alert management in the food industries is attempting to visualize the possibilities in the uncertain future, we present this brief statement of the social policy of the Columbia Conserve Co., of Indianapolis. For seventeen years it has been experimenting with methods that many enthusiasts are certain will be much more common as the years go by.

The author, Norman Hapgood, known to the public as author and lecturer, was one time editor of *Collier's, Harper's Weekly* and later of *Hearst's International.* Woodrow Wilson appointed him as Ambassador to Denmark. Mr. Hapgood is one of the principal stockholders of Columbia Conserve Co. —THE EDITORS.

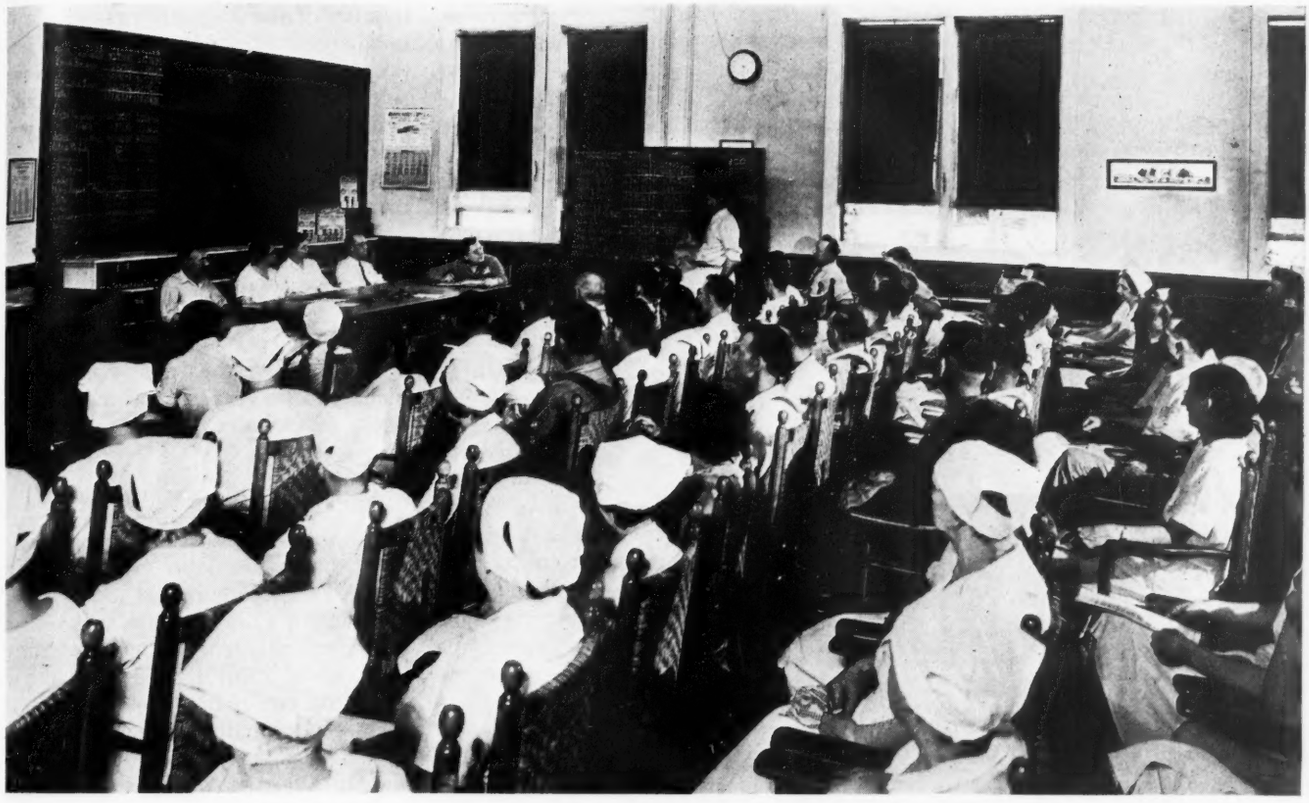
SINCE the world business collapse of 1929, it is natural that inquiries about how the policies of our company are working, and what was the original impulse behind them, should be more numerous. As the nation has been interested in the attempt of Washington to lead to a "New Deal," so it has shown a rapidly increasing desire to know the motives and consequences of new social standards that began in the Columbia Conserve Co., in Indianapolis, seventeen years ago.

Another influence toward widespread study of our results is the wider use by us of our own label. While our business was almost wholly under the labels of the wholesalers there was no natural method of concentrating attention on the company itself, but now that the part of our business done under the Columbia label is rapidly increasing, people everywhere identify the soup they are buying with the principles of which they may have more or less vaguely heard.

After my father died, in 1917, my brother, William P. Hapgood, as president of the company, felt more responsibility than he had felt before for the human principles behind the business, and it was from his feelings that the changes began. They were at first, and remain since, experimental in detail, though inspired by general beliefs. As he has said himself: "We must, from time to time, reshape our course as we get new experiences. Our effort has not been to secure a particular form of government—call it democracy or anything else—but to develop a new kind of association between workers and stockholders, technicians and the rank and file. Such an association can be developed only by trial and error, by the slow process of education over a period of years—in fact, a continuing process which will not end as long as life lasts."

The most important changes were begun at once. It was in 1917 that my brother told the workers that, as rapidly as they chose, they could begin to fix hours of work, their incomes, their share of the total production, and select their leaders. They were skeptical at first about the good faith of the announcement and also about its feasibility, as their lack of education and of wide experience had, as usual, kept them from developing confidence in themselves.

In about two years, however, results began to appear, and it was not long before, under the influence of a



Every Friday afternoon the personnel of Columbia Conserve Co. assembles to learn and discuss the progress of the enterprise. Note that nothing is withheld. Even comfortable chairs are available.

new enthusiasm, unit costs went down. This was an early and impressive indication that the men and women were working better when they were more interested and had more to hope for. It was in 1919, when I was in Denmark, that a letter from my brother showed how needless had been the fear that a group of workers must necessarily fall into the error of advancing their wages or salaries too rapidly; they will not do it if they have been developed by business itself, in American traditions, with an increase in responsibility under the right inspiration and leadership.

This letter related that, seeing the cost of living going up, my brother had suggested a corresponding raise in the amount of payment. This suggestion was in the early summer. As our fiscal year then corresponded to the calendar year, it was decided unsafe to advance the standard payment, because until taking account of stock at the end of the year there could not be an accurate estimate of what the business could, consistent with its welfare, afford in the way of advances. So it was January before the advance was made; and on the whole, during all of our experience, power has brought out decided conservatism, except for a time during the worst of the depression.

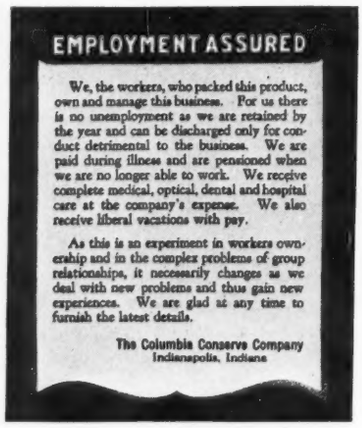
At this time my brother felt that the greatest tragedy in the life of a working man was not the number of hours he needed to work but the lack of pleasure and education connected with his job. It was from this point of view that participation by all in the problems of the business was sought; but, of course, it was realized that the idea could not succeed unless efficiency did not fall off as a result of self-government. Obviously it could not succeed unless a considerable number of workers developed an interest in balance sheets.

Another conception came in at about the same time, though not so much stressed until the depression brought its new difficulties. This was the belief that men and women should not be regarded as machines, owned by capital, to be thrown away whenever a lessening of the number of employees could increase that profit which went to the holders of the stock. It soon came to be tacitly assumed that if a person had become an acceptable member of the force, everything should be done to see that such a person had a safe position during his or her working life; and this was soon followed by the logical extension to protecting old age by carrying payment along until death.

In the early days there was an occasional attempt to substitute ordinary trades-union connections for the council which ran the business, and which, after a few experiments, came to include all the regular workers. This issue, flaring up occasionally, died completely in 1932, after financial changes which I shall describe later, for then, in reply to some of those who wished us to be unionized, William Green, president of the American Federation of Labor, wrote: "The executive council of the American Federation of Labor, at one of its recent meetings, had under consideration the proposal for the organization and chartering of the employees of the Columbia Conserve Co., of Indianapolis. The matter was very carefully investigated by a member of the executive council, and report thereon made to the council. With this report before it, the conclusion reached by the executive council was adverse to the proposal, as the report brought out that the relations between the company and its employees are not the relation of employer with its employees, paid a stipulated wage per day or per week, but the employees are stockholders in the company and are not paid on a wage-working basis."

This position of the federation, which seems to us sound, was the re-

sult of a step taken in 1925. It was then decided that those who had put their money into the company were being paid too much in comparison with those who were putting their lives into it. A contract was made, therefore, between the workers and the owners of the common stock by which, when the earnings should pass beyond what in fact amounted to about 7 per cent on the money actually invested, cumulative, the rest should be used to buy up the common stock, to be held permanently in trust, the results to be divided among those then at work in the company, as conditions might justify. At this time, 63 per cent of the stock is so held, and but for the depression it would have been 100 per cent before now. The federation therefore agrees completely with our own feeling, that what is most desirable is that the workers should have the psychology of owners, not of employees.


EMPLOYMENT ASSURED
We, the workers, who packed this product, own and manage this business. For us there is no unemployment as we are retained by the year and can be discharged only for conduct detrimental to the business. We are paid during illness and are pensioned when we are no longer able to work. We receive complete medical, optical, dental and hospital care at the company's expense. We also receive liberal vacations with pay.
As this is an experiment in workers ownership and in the complex problems of group relationships, it necessarily changes as we deal with new problems and thus gain new experiences. We are glad at any time to furnish the latest details.
The Columbia Conserve Company
Indianapolis, Indiana

On the back panel of each can label is found this statement.

Nevertheless, except as made impossible during the depression the weekly payments, which we call salaries, but which philosophically are more like advances on profits, are much higher than in the canning business generally. This is true even without taking into account the actual saving to the individual of having all his medical expenses and dental expenses eliminated by the company's furnishing those services free; having the same payment during illness as when he works; having full payment during three weeks of vacation; and not needing to do as much to protect his old age, since his salary will go on.

Naturally, as the workers are owners, they all have the fullest access to the books. Every week the executive committee, consisting of nine members, discusses the finance reports, and any members of the company who take an interest can attend. The chairman of the council attends regularly, in order to be able to give information to any who may seek it. Contrary to the usual situation, where business facts are often concealed from all except a few, our effort always is to have as many as possible fully conversant with them.

When, after heavy losses for two years, due to the depression, the council had to face the alternative of either lowering the standard of living for a time or else giving up one of our cherished principles, permanence of employment, and reducing the force to the number actually needed, the decision was unanimous to meet the hardship together rather than to let the weaker ones go.

However, there has been a natural diminution of the number during the depression. If a woman marries and stops work we do not fill her place, as is the case if a man finds it advantageous for some reason to leave Indianapolis, to take another position or perhaps to be with relatives. The only serious controversy we have had also grew out of the depression: a number resigned then and two were discharged for obstruction. This was essentially a controversy between the trained technical staff and a group, rendered unhappy by worse conditions, who were led by the familiar exhorting and organizing methods of a few whose training had been in socialist and left-wing labor politics, and most of whom had not been with us long. We shall not fill these vacancies until general business improves. We have stopped the losses, but not yet gone into appreciable profits, and probably shall not do so until the grocery business shows more recovery.

So now our staff is not much over two-thirds of normal. Of the 118, there are 29 wage workers, some of whom will no doubt become regular salaried members later. Of the 89 salaried members it might be roughly estimated that there are twelve who deal actively with the business figures all the time, about ten whose interest in the figures presented is fairly active and probably another dozen who have some interest, passive in nature and not shown openly. To this number, about a third or a little more, among the salaried members, who may be included as interested in figures, should be added a certain number of the wage earners, who cannot be estimated because they do not take part in the discussions. Also the salesmen, those occupied with publicity and medical attention, and a few scattered workers, whose duties keep them away—20 in all—would show a rather high average of interest.

It ought to be said, however, that an essential element in keeping so large a percentage interested in a matter so technical as figures is the tradition in our organization that it is the duty of the leaders and technicians to be very patient and always ready to explain.

Much Interest in Plan

As to how much other organizations could learn from our experience it is certainly not for us to say. We have had a sufficient task in working our own problem to a satisfactory conclusion. But it is true that the study of our plan by other business men very rapidly increases. I now give a large part of my time to lecturing, in all parts of the country, and on the whole I am asked more questions about this practical experiment in finding an answer to the defects of the relations between capital and labor than I am asked on any other subject. Less than a month ago we received a letter from a man connected with the relief work of the federal government, in which he said: "It seems to me that you have done a tremendously important job. As a matter of fact, I am now exploring the possibilities of offering to utilize not only your experience but your organization."

In summing up what we have learned about the possibility of running a business on more cooperative lines than is usual, it is to be said that the first business gain, reduction of unit costs, is easily explained by the increased willingness not only to work hard but also to shift from one form of work to another according to the need of the season. Salesmanship is partly a special aptitude, and it is also helped by more education than most of our staff have had, so that branch of the business has given us our most lasting problem. On the aspect more particularly emphasized in this article, of finance and the understanding of figures, it may fairly be said that, while we have not developed financial genius, we have as large a percentage who take an intelligent interest in the figures as should be expected or as is necessary to our business activities.

And Now We Have *Dated Bread*

By H. W. STRONG
Cincinnati, Ohio

TAKING a leaf from the book of "dated coffee" merchandisers, bread bakers are becoming "date conscious" regarding their products. This trend has become particularly noticeable within the past few months, since the Bureau of Home Economics, Consumers' Advisory Board, Food and Drug Administration and various other bureaus and organizations have been making bakery products their targets for label declaration of quality and composition.

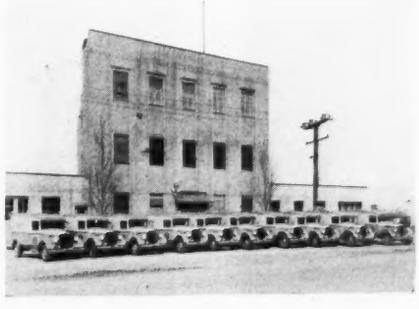
In its various aspects, dating of bread has been practiced, more or less covertly, for quite some time by different baking concerns. Some have coded their wrappers so that they themselves could identify the bread as to composition and day of baking if any noteworthy consumer reaction followed its introduction to the market. Observing consumers could decipher the code and begin to know on what days their favorite loaves were baked. As these codes were changed periodically and the consumer would again have the "skull-practice" of deciphering them, it was not a satisfactory guide to the consumer who could not otherwise detect bread that was more than 24 hours out of the oven.

Other more progressive concerns who prided themselves on their merchandising and were desirous of building up consumer good will and keeping returned stales to the minimum boldly began to date their wrappers even before there came to be so much "government in business," and in their way put a brake on wagon men overstocking retail outlets and "rolling" stale loaves from one store to another.

With this form of dating the housewife knows almost how many hours the bread has been out of the oven when she buys it and is aided considerably in comparing the quality and palatability of the various loaves handled by her retailer.

Dayton Bread Co. tells the world just how long the bread is to be called Fresh Bread.

Probably the greatest problem the bread baker faces is to produce a loaf which after a lapse of several days will still be delicious in taste, delightful in texture, and have as marked an appetite appeal as it had on the day it was baked. Various moisture-retaining ingredients have been tried; different types and quantities of shortenings have been used; various times and temperatures, as well as other baking conditions, have been inflicted upon bread to keep it from staling; and extreme methods of cooling and storing of the baked loaves have been experimented with to no satisfactory solution of the problem. Mold, rope, absorbed flavors or odors, sourness and similar troubles are almost self-explanatory as to cause; but staleness, the headache producer for all bread, biscuit and cracker bakers, is something else again. Its presence can be and has been quantitatively, as well as qualitatively, determined, but a means of assuring its absence is the "philosopher's stone" that all bakers seek.



Dating seems to be the one way of giving the housewife some protection against stale bread.

Dayton Bread Co., of Dayton, Ohio, maker of "Miami Maid" products, is one of the pioneers in this bread-dating venture and is the first company to put out dated loaves within a 40-mile radius of Dayton. A. E. Craig, vice-president and general manager of the company, believes it is something the average housewife has been waiting for. He says that, even in the short while in which his company has had dated bread on the market, the increase in its sales has been very noticeable.

Instead of employing numerals, thereby compelling the housewife to read a calendar before she can determine the age of the bread, each wrapper is printed with a statement advising her that the loaf is not to be sold as fresh bread after the day designated on it. That day always is two days after the loaf is baked. This procedure, of course, requires different wrappers for each day of the week, just as the dealers in fluid milk have different plug caps and hood caps for each day of the week.

Liquid Waste Disposal

No Chemicals . . . No Complicated Equipment . . . No Conservation Law Violated

By HERBERT H. YOUNG
Sanitary Engineer
Indianapolis, Ind.

and

A. ELLIOTT KIMBERLEY
Consulting Sanitary Engineer
Columbus, Ohio

FEW plants are so fortunate as to have available a large stream or a big-city sewer system into which wastes from the plant can be discharged and then forgotten. Most plants find it necessary to treat the wastes before disposing of them. The methods used vary from screening the waste to remove the coarse suspended solids to passing it through a complicated trickling filter. Some of these methods are inexpensive but relatively ineffective, while others are effective but involve considerable investment.

A happy medium in alleviating serious pollution at not an excessive expense has been pioneered and developed at a large Indiana canning plant where the only outlet for sewage was a small, easily polluted stream. A large variety of products are packed in this factory, and the system of treatment needs to be adequate to handle the wastes from all these products. Put into operation in 1932, the system combines new and old ideas and has solved a problem where previous methods had failed.

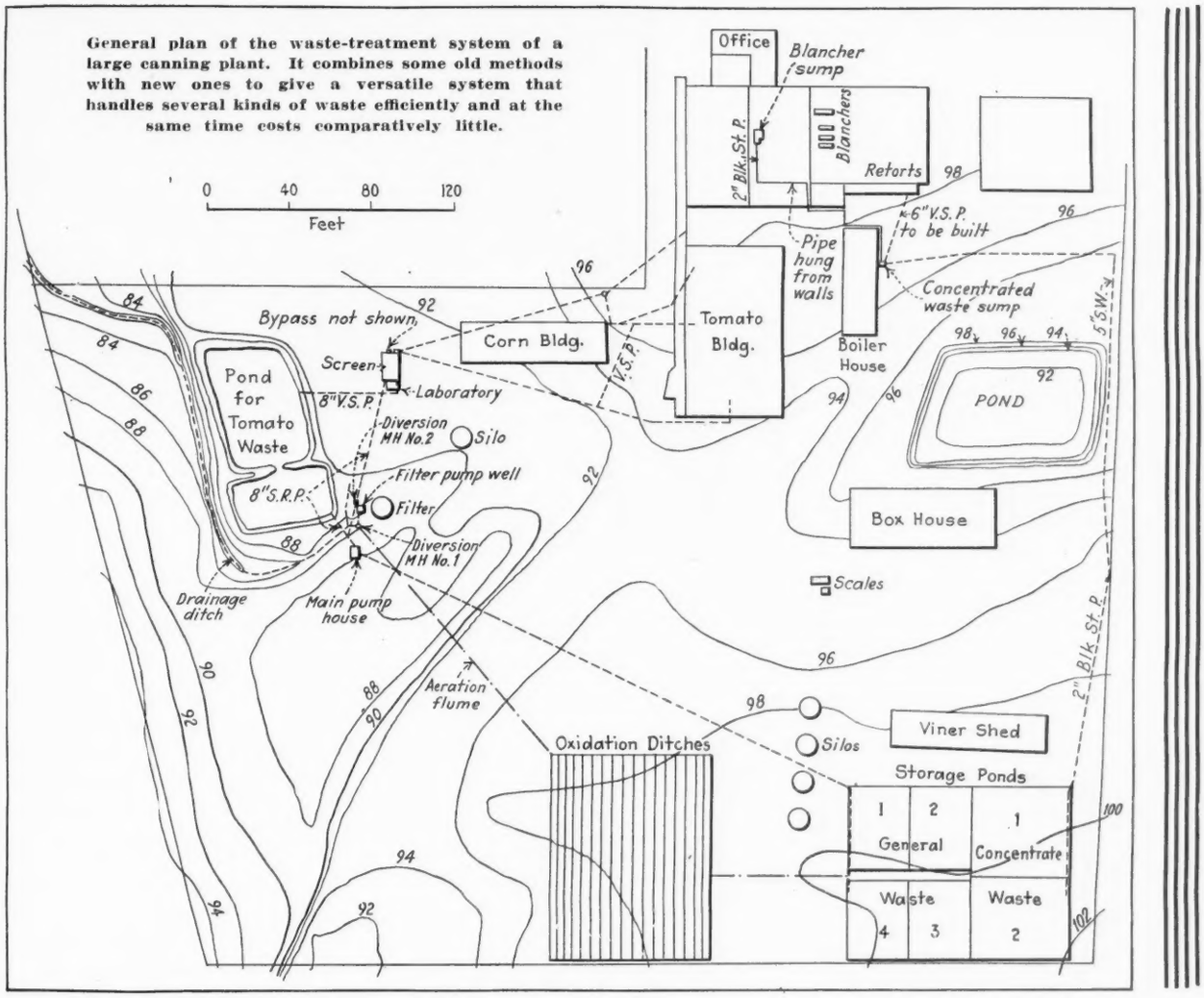
Two main types of wastes result from canning operations. The first step in this scheme of disposal is the separation of these wastes within the plant. The first type is made up of the strong wastes, such as that from the vegetable peeler, pumpkin steamer and press, as well as drainage from pea vines and corn shucks. The second type comprises the relatively weak wastes incident to washing and general operations, plus the clean-up waste. A possible third type consists of unpolluted cooling water, which should not be mixed with the other wastes prior to their treatment but can be reused or discharged to the receiving stream without treatment. Fortunately, the strong wastes are small in volume compared to the general wastes, and they can be collected in a separate system and stored in ponds. At the Indiana cannery, the system uses two such ponds, which are sufficient in size to accommodate a season's run if necessary. The waste can be discharged from these ponds a little at a time after the season is over, or it can be eased out at such times as there is an excess of water in the stream. The drainage from the pea vines and corn shucks is kept entirely separate in ponds, so that it cannot get into the creek. As this drainage accumulates, it is hauled away in a tank wagon and spread on fields, where it seeps away.

The general waste is large in volume and presents the most difficult problem. The first operation in the disposal of this waste begins within the plant itself with what is called "good housekeeping"—that is, keeping as much of the solid and waste material out of the sewer system as possible. It seems to be general practice in a large number of canning factories to dump all waste material on the floor and then to wash it down the sewer. *If this material can be kept out of the sewer in the first place, it will not have to be removed later in the treatment process.* It is much easier to remove the solids at the source before they come in contact with water and dissolve than to screen or settle them out afterward.

Included in the material that is removed from the general waste by good housekeeping is the pomace from the pulpers and finishers, culled tomatoes, tomato peelings, peas, beans and so on, which fall on the floor during the canning operations. Much

Concentrated wastes, small compared to general wastes, can be collected in a separate system and stored in ponds of this type. The waste can be discharged a little at a time after the season is over.

Tomato waste passes through special presettling ponds and then combines with the general waste and is pumped to the storage ponds. These ponds have a capacity sufficient for about twelve hours' operation.



General plan of the waste-treatment system of a large canning plant. It combines some old methods with new ones to give a versatile system that handles several kinds of waste efficiently and at the same time costs comparatively little.

of this waste material is collected in buckets or wheelbarrows at its source, and screens over all floor drains keep a large quantity of the spillage out of the sewers. These wastes are then hauled away in a semi-dry state and disposed of by spreading on fields. A surprising reduction in the strength of the waste can be effected by good housekeeping. This scheme also has an advantage in that less water is necessary to keep the plant clean.

The first step in treating waste which does not reach the plant sewer system is to remove as much as possible of the remaining solid material by the use of fine screens. Mechanically cleaned rotating screens are very good for this purpose, although at the Indiana plant, due to local conditions, a series of fixed screens are used. These screens set in a concrete tank and are cleaned by hand. Ahead of

(Turn to page 322)

Settled wastes, fairly free of suspended solids and reduced in strength by fermentation, flow into an oxidation ditch for purification. The ditch, which winds back and forth, is about a mile long.

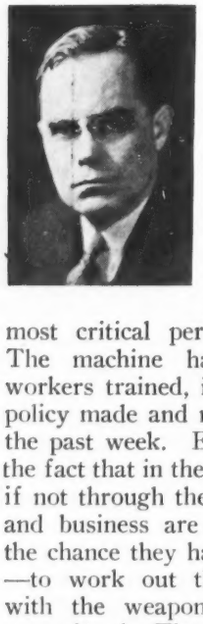
The first step in treating waste is to remove as much as possible of the solid material by fine screens. Local conditions necessitate fixed screens in this plant, but rotating screens are preferred.

U. S. Department of Commerce Building, Home of N.R.A.

What Will Become of N.R.A.?

Outcome of General Johnson's Rear-Guard Defense Held Key to the Future

By **WALLACE THOMPSON**
McGraw-Hill Publishing Co.
Washington, D. C.



N.R.A. is half way through its two-year span; the act creating it was signed on June 16, 1933. Before it stretches the most critical period of its history. The machine has been built, its workers trained, immense changes in policy made and revised, even within the past week. Every sign points to the fact that in the coming six months, if not through the full year, industry and business are going to be given the chance they have been crying for —to work out their own salvation with the weapons of N.R.A. that are at hand. The President is leaving Washington for a long sea trip, and N.R.A. is consolidating its lines rapidly, apparently to give a chance to the field generals to carry out some of the tactics which they have been declaring will alone save the situation from this point onward.

Meanwhile, appraisal of the situation is best summed up in a military analogy. Thus, N.R.A. may be taken to be in the midst of its greatest strategic crisis, and the indications of its moves from this point onward are of tremendous importance. It is fighting not alone its frontal battle against the depression over an increasingly difficult terrain but also a rear-guard action against the forces of unfinished policies left behind in its spectacular drive forward, as well as actions on two crumbling flanks. Industry and labor, disappointed at the failure of many promises, are questioning and faltering.

The rear action is the most critical. In its spectacular rush forward, N.R.A. left behind it the unsettled questions of permanent policies and failed to set up firm bases on such fundamental issues as pricing, labor rights, trade practices, inter-code conflicts, regional differentials, small industries, monopolies, administration powers in code authorities, and internal organization.

Labor's flank is weakening because labor is auditing that which it has really gained, as contrasted with actual and implied promises. Both organized labor and the unorganized working man are faced with increased prices and work-spreading which flatten his personal pay envelope even as national purchasing power rises.

Industry's flank is crumbling because, on the production side, the cost of recovery is looming bigger than industry's immediate gains in many cases, and, on the distribution side, through worries as to how it is going to pay the bills by increased sales or restored profits.

The battle, as yet, is far from a losing one. N.R.A.'s greatest strength unquestionably lies in the fact that industry as a whole likes its codes; that organizations in industry are ready to fight for them—selfishly or altruistically, it does not matter. That labor likes what it has gotten and hopes for much more is a reserve force that must be taken into account in the battle. But there is disintegrating influence to be met in both armies' flanks.

Industry feels that the time has come for it to handle its own strategy with new weapons forged behind the protecting lines of N.R.A., but, none the less, its own weapons. At the same time labor is struggling bitterly to organize an offensive on its own lines. Virtually all the great strikes, actual and impending, are for labor-union recognition and are retarding the recovery movement. However, they represent labor's prime demand for a right to fight the depression with its own weapons. N.R.A. has said it will let that clash between Industry and Labor be fought out; it is the rear-guard fight that is the crucial one today. The flanks will hold if the rear can be consolidated and the lines of communications can be reopened back to solid economic principles and policies.

General Johnson has become the symbol of this rear-guard weakness. However, he has never before turned his forces to this problem as he is turning them today. His policy was frankly, at the beginning, to mass everything for the frontal attack, to arouse enthusiasm, inspire fear, codify every industry, continually decrease hours and raise wages; and to

do it so fast that the cost of living would not have a chance to catch up with it. He swept the depression before him, kept the country at wartime enthusiasm for an unbelievable length of time, got every big industry except those in the food field and hundreds of small ones under codes, formed fighting units on compliance and labor crises.

But behind him, lines of communication were weakening. There was a long stretch over which he could not move the big guns of sound economic policy, and when the enemy solved his attack, he had no other weapons of offense. The enemy was intrenched and he had no artillery with his flying cavalry. He has let his organization degenerate into a group of yes-men. He tried four times, and each time abandoned plans for a cabinet—a general staff. He waved aside the necessity of formulating policies on basic questions. Consequently code making and enforcement fell back on isolated precedents which he overthrew if the necessities of the frontal battle demanded. He left his deputies trying to guess "what will get by" in codes; left industry and labor to fall back into the ancient craft of "bringing pressure" (and winning their points thereby); left the country wondering blindly whether there were any firm rules and guessing not only at the solution of the pending issues but also guessing as to what he might decide, at what Congress might do; at what, indeed, the President might do.

THE problem facing N.R.A. at the battle's turn probably is best expressed as the need of simplification. There is an admitted need of fewer codes; of a recasting, perhaps, of the whole code structure. This simplification has been under way and the first step, a plan for large groups of small industries, was announced recently. There is an admitted need for simplifications of trade-practice provisions, a setting of definite criteria through which a standard list can pass as to whether the provisions are in the public interest, whether they are enforceable, whether they can be generalized with additions or exceptions to an approved list as industry needs and practice may demand. Also just announced, and not the least important, is the revision of pricing provisions. The mass of conflicting labor provisions, chiefly administrative, also needs to be cleared up to eliminate exceptions: for instance, we may come to a basic 40-hour week with time-and-a-half for overtime, which would be a self-policing provision that would not throttle certain industries nor hold back the reabsorption of workers.

The pricing problem looms as one of the chief internal policies to be clarified. It has been confronting N.R.A. for a whole year. It is now on the way to solution, and elimination of price fixing from future codes has been announced. Revision of the handling of small codes and intrastate codes will also take some of this away from N.R.A., but the deciding power in case of disputes is to remain in Washington. The pricing policy is, moreover, now to become an administrative policy. There has been set aside $50,000 for a study of prices under codes, following recommendations of the Cabinet price board.

Code-granted profits will be in the line of fire, as will the right of industries to declare "emergencies" and reduce working hours when their stocks pile up and prices threaten to drop, and the right of industries to control production and installations of modern machinery in order to maintain a dwindling price structure, to save inefficient plants at the expense of greater production, lower prices, and higher real wages. The issue here is fundamental. It has been taken out of the hands of N.R.A. Its decision this summer will be of transcendent importance.

Labor's fundamental problems emerge from this one. The workers are restive, are open to drives for organization in traditionally open-shop industries because of restiveness tracing back to falling real wages, with rising prices which no wage increases seem able to overtake, a realization that shorter hours are not half so good as more money to spend in the leisure hours they already had.

IN a decidedly pragmatic way, labor is wondering why, in times of recovery, it has to go from round steak to stew instead of to porterhouse. And workers are naturally suspicious of artificial shortening of hours—technological changes have been taking care of that anyway and labor is about ready to cash in on the stupendous promises of Mr. Sloan's great symposium at Chicago last month.

These two phases of the rear-guard battle lead to the basic question, which is to be settled this summer, whether there is to be emphasis on *real* income, which means increased productivity (instead of curtailment of production through shrinking machine hours and the premium on inefficiency and perhaps less employment or slimmer pay envelopes) and lower prices and more goods sold, or, by contrast, more inflation and another threatened breakdown.

All of this *seems* to lie in the lap of N.R.A.—it certainly does if N.R.A. is to continue. Yet there is reason to believe that Washington is not overly worried about the crisis in the affairs of N.R.A. nor at the barrage which is being driven against its present confusion. Out of the criticism can well emerge a revamping of the whole structure, a setting up of sound judicial procedure, backed by widely known and easily understood policies. How this will be done does not yet appear.

THE tendency now is to make General Johnson the symbol of the old régime, give him due credit and the honors that his magnificent achievements deserve, and retire him in favor of an entirely different type of executive. If this is to be the method, time presses. N.R.A.'s internal organization is slipping, and it may not be even a good "bureaucratic set-up" if its disintegration goes much further. On the other hand, there is a sound nucleus for reoroganization within N.R.A., with Edward F. McGrady, assistant administrator; Donald Richberg, chief counsel, and Leon Henderson, chief economist, as the key men in high place.

In the hot months ahead, industry apparently is going to be given the very chance it has been crying for, to carry on the recovery itself—with the blessings of the administration and all the help it can give, even to better and surer ground at N.R.A. for its first really free trial of the codes. Labor will be allowed to fight out its battles, which, surprisingly enough, do not seem to worry Washington overmuch, as yet. Behind the lines in Washington, the pounding out of sound policies will go on. Organization will be made more fit. Direct recovery plans like the rebuilding drive and the freeing of private credit from its real and imagined shackles will go forward, and the eyes of the country will be on every move. It should be a quiet summer—but one big with results built by industry and labor themselves on the sound (if somewhat uneven) foundations that N.R.A. has built.

Wet Labeling

Becomes Less Wet When It Is Mechanized . . . . . But the Principles Are Just the Same

Part I

By L. V. BURTON
Editor, Food Industries

OF ALL the possible ways to apply a paper label, the method of shrinking the label onto the package or container gives the most perfect results. But, as it is with the satisfaction obtained from the best the world can produce, the cost of perfection is something to be balanced against its value to the user.

Wet labeling was once a hand job —always—although it is now completely mechanized. But, to appreciate the development of mechanization in wet labeling, it is first necessary to understand the operation as it is done by hand. In either case, however, the result is a label perfectly applied and stuck to the container at every point. In fact, the principle of sticking it to the container at every point is the chief characteristic of the method.

Wet labeling is merely a specialized method of applying labels and gets its name from the method of soaking the labels in paste when it is done as a hand job. And when one says "soaking," he means saturating them.

When it is to a manufacturer's advantage to put out his packages labeled in such a way that the housewife cannot possibly lose the label or remove it by any method short of soaking or scraping, then he has the economic justification for a wet labeling job. The advantage of the method to the user is measured largely in terms of the advertising value which will accrue from a neat

Fig. 1—"Laying" the labels in special starch paste in piles of about 100. Labels can stay wet for 48 hours without damage to themselves, but after 24 hours the paste becomes thin and must be replaced.

Fig. 2—When packages weigh less than 1 lb., an average girl can label 6,000 packages per day after two months' experience. This speed is possible only when labeling from and to the same belt.

Fig. 3—A pile of soaked labels that have been "laid" in a special starch paste is placed upside-down in front of each operator.

Fig. 4—Wrinkled labels on the three cans on the left are still wet; those on the right are thoroughly dry. Note how the shrinking during drying pulls the label so tightly that the lower edge of the slip cover shows through the paper.

package bearing a permanent, neat label in the housewife's pantry for weeks or months on end.

A further technical advantage in favor of wet labeling is found in the very tight seal between the lid and the body if the package happens to be a slip-cover can. Yet when tightness of seal is essential, it can be obtained in the container itself, as for example, by the use of a friction-top can or a packer's can instead of a slip-cover closure. Hence, smart appearance over a long period of time is the primary reason for using one of the variants of the wet-labeling method.

Hand labeling by the wet method is often utilized in highly mechanized plants for occasional small orders of odd sizes of packages, where the volume of business is too small or too irregular to justify the necessary variety of sizes of labeling machines. Up to now the adjustability feature of some forms of packaging machines has not been built into the machines for wet labeling. Therefore, a separate machine is needed for each size.

Packers' cans, with both ends double seamed, seldom offer any reason for departure from the traditional type of machine labeling with dry labels. The reason is that in the consumer's home, food containers of this type invariably are opened, the contents used almost immediately, and the container then promptly discarded. Under such a set of conditions, the rims of the cans plus the three or four points of label pick-up, plus the pasted lap of the label are ample to insure that the label cannot come off either in the packing or distribution process.

Slip-cover cans and friction-top cans are most frequently used for products that justify wet labeling. The familiar baking powder can typifies the container that fulfills all the postulates for this form of labeling.

At the Rumford Chemical Works, when baking powder was first manufactured, long before the modern labeling machine was available, all labeling was done by hand by the wet method. Only within the most recent times has this particular type of labeling operation been successfully mechanized and adopted for the bulk of Rumford operations.

Whether wet labeling is done by hand or machine, the labels and containers must be thoroughly dried, either naturally or artificially, and the labels thus shrunk on before packing into shipping containers.

Hand Method Detailed

Although some differences of opinion exist among specialists in labeling, the majority belief is that labels for wet labeling must be cut from the paper in such a way that the grain of the paper runs the long way of the label. All are agreed, however, that the greatest shrinking when drying the labels should be circumferential rather than lateral, in order to obtain an exceedingly tight fit. The direction of the grain in these labels should be just the opposite to the direction desired in labels for labeling packer's cans, where the label is held to the container in only three or four spots in a vertical line and any circumferential expansion of the paper cannot possibly result in a wrinkled label.

Paste for wet labeling should always be of a special kind, slightly on the alkaline side (never on the acid side), according to the experience of the Rumford Chemical Works. However, such a paste can be supplied by any well-informed paste maker who knows the purpose for which it is intended.

Literally the labels are soaked in the paste by the method shown in Fig. 1, known as "laying the labels." Where a suitable paste is employed, no fuzziness or dried paste will be observable on the outside of the labels after they have been dried on the cans, which is the reason why Rumford uses alkaline paste. In the hand operation this paste both sticks the labels everywhere to the can and likewise serves as a lap paste.

Surprising speed can be developed by individual operators. An average girl can label 6,000 packages weighing less than 1 lb. each per day after about two months' experience. Her speed is somewhat less with packages weighing more than a pound. Such a speed can be attained only when labeling "from and to the same belt," by which is meant that the unlabeled packages come to her on the same belt which takes them away. When trays are used to bring the unlabeled packages to the worker, the speed is considerably reduced. When hand label-

ing 10-lb. baking powder packages, a size for which there are no automatic labeling machines available, because of the limited demand for them, the rate of labeling is very slow, although the volume of material carried in the stream of packages is very large. The so-called alkaline paste used by Rumford Chemical Works is made by adding about 1 oz. of special alkaline starch to each quart of warm water when the mixing is done by hand. If a machine mixer is available, a slightly smaller quantity may be used. In determining the right quantity to use, the operator's judgment is based on his own experience. From 14 oz. to 16 oz. of special starch per 14-qt. pail of water represents the extremes in variation met at Rumford.

Labels can be soaked in this paste as long as 24 hours without mishap. The soaking time can be extended further to 48 hours without making the labels too soft, but in the interval between 24 and 48 hours of soaking, the alkaline starch paste becomes thinner and loses much of its adhesiveness. When thin paste is encountered at this stage, the labels are removed from the paste, the excess is squeezed out of the pile of "laid" labels, after which they are soaked in fresh paste to which borax is added in the proportion of one teaspoonful to a 14-qt. pail of paste. The function of the borax is to increase the adhesiveness of the paste. After a very short interval in the new paste the labels are ready to use.

As soon as the labels are applied to the cans by hand, they must be dried thoroughly and shrunk into place. At Rumford's this is done by placing them on a conveyor leading through a Proctor & Schwartz dryer, the operation of which will be described in the second section of this article, appearing in a subsequent issue of FOOD INDUSTRIES.

Reasons for Alkaline Paste

No one should misunderstand the degree of alkalinity of the paste. It is so near to the neutral point that girls can keep their hands in it all day long without harm to their skin.

If, however, the so-called acid paste is used, the dried labels will show flakes of dried paste all over the surface and be very unsightly. Alkaline paste, so called, dries without exhibiting any flaking. It remains smooth and transparent, and in the Rumford experience it actually adheres to the tin of the can.

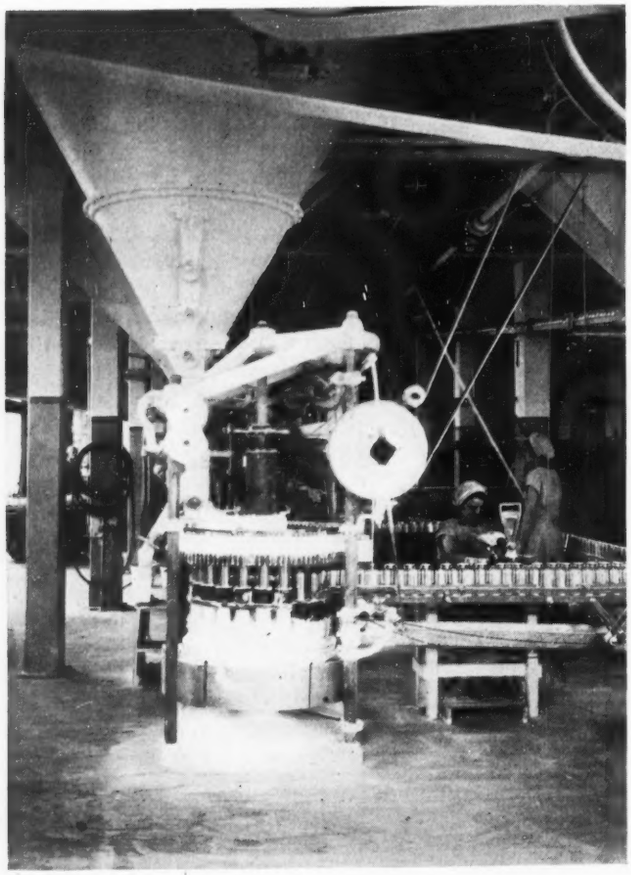
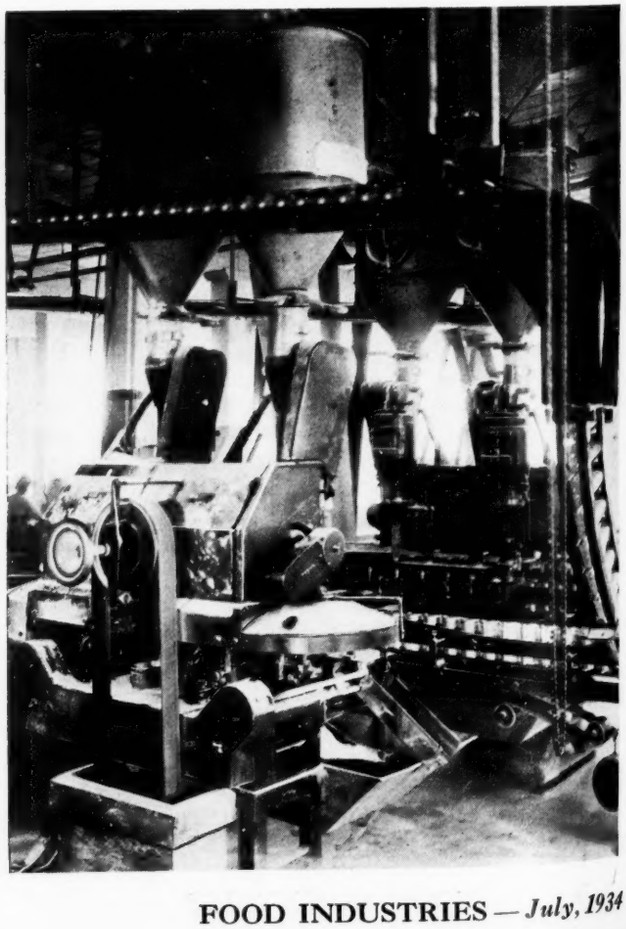


Fig. 5—Filling 1-lb. cans of baking powder with a Small filler.

Fig. 6—Filling 1-lb. cans of baking powder with a Pneumatic Scale filler.



A New Method for Determining the Jellying Power of Fruit-Juice Extractions

By GEORGE L. BAKER
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GRADUALLY research workers have bared the mysteries of jelly making and revealed the physical chemistry upon which the art depends for success. Beginning with Tarr's discovery of the important rôle of hydrogen-ion concentration in fruit jelly[1] formation, the Delaware Agricultural Experiment Station has been making a series of studies on factors influencing the formation of these jellies. Although the greater part of these studies have been of a technical nature they have a practical interpretation.

The latest accomplishment of this group of research workers is a method of jelly making based on Myers' and Baker's correlation of the viscosity of pectin solutions with the jellying power of the pectin.[2]

The viscosity of a fruit juice, as referred to in this article, is the ratio of the time of flow of the fruit juice through a given orifice compared to the time of flow of an equal quantity of water at the same temperature.

Sugars, proteins and starches influence the viscosity to a slight extent, although the main influence on the viscosity of fruit-juice extractions is the colloid, pectin. If, then, we measure the viscosity of the extracted juices, we have a fairly accurate means of determining the quality and quantity of the pectin present. As the quality and quantity of pectin present determine the quantity of sugar which can be added to the extracted juice, the viscosity can be used as an index for the quantity of sugar to be added.

Reasoning from that premise, if the viscosity of fruit-juice extractions can be measured by the manufacturer of fruit jellies, he will have an accurate means of telling just how much sugar to add. Going further, if a definite percentage of sugar composition is agreed upon, a final weight to which the jelly must be cooked can be calculated.

Embodying this idea of relationships, a simple viscosity pipette was devised and methods for its use were developed. The pipette is, in fact, the Ostwald pipette cut off at the bottom of the capillary to make it less expensive to manufacture and easier to clean. As shown in the figure, the pipette consists of a capillary tube about 10 cm. long sealed to a bulb of about 2 c.c. capacity. The bulb is blown on the end of a glass tube of about 4 mm. inside diameter. The tube is slightly constricted as it enters the bulb chamber and extends about 5 cm. away from the bulb. At *A*, the place of constriction, and at *B*, about 2 cm. below the bulb on the capillary, etched calibration marks are placed. The capillary should be so small that it takes water at room temperature—70-80 deg. F.—about 40 seconds to run between the marks *A* and *B*.

In practical use a small quantity of the extracted juice is brought to room temperature and then drawn up through the capillary into the bulb to above the constriction marked *A*. The time for the juice to flow back of its own free will, when the apparatus is held upright, from mark *A* to mark *B* is recorded in seconds. This time is divided numerically by the time in seconds it takes water of the same temperature to flow between these same marks. The resulting value is called the relative viscosity of the juice. The higher this relative value the greater will be its jelly-forming characteristics.

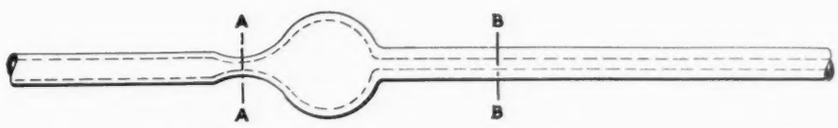
By experimenting with various fruit-juice extractions, tables have been compiled showing the quantity of sugar to be added for each viscosity found. In the accompanying table is found the proportions of fruit juice and sugar to use and the final weight to which the mix should be boiled to produce a satisfactory household jelly.

According to these relationships, if

(Turn to page 315)

Table—Relationships Between Viscosity of Juice, Sugar Added, and Jelly Produced

Relative Viscosity	Ounces Sugar to be Added for Each Ounce of Juice	Ounces Final Weight per Ounce of Juice
4	0.53	0.88
5	0.69	1.15
6	0.81	1.35
7	0.90	1.50
8	1.00	1.66
9	1.06	1.76
10	1.12	1.86
11	1.18	1.96
12	1.25	2.08



Viscosity of fruit juice, relative to water at same temperature, is determined from time required for it to flow from *A* to *B* with pipette in vertical position.

Published with the approval of the Director of the Delaware Agricultural Experiment Station.

Mid-June Survey of Drought Effects Gives Forecasting Basis for *Food Raw Materials*

By JOHN E. POOLE
Chicago Livestock Exchange

● **A personal survey, by this experienced observer, of the drought-stricken areas of the upper Mississippi Valley from eastern Ohio to Montana gives a basis for a forecast of future supplies which food executives will prize. Mr. Poole's observations of crop and livestock conditions, as well as farmer psychology, are of great importance, not only to meat packers but to all the food industry.**

SCATTERED rain over the drought area extending from Ohio to the Rocky Mountains materially ameliorated the desperate physical condition of the country in mid-June. A previously swelling marketward movement of distressed livestock promptly contracted. Hope of at least a normal corn crop mounted. But relief did not arrive until winter wheat had been irretrievably doomed, the spring wheat outlook rendered hopeless and the hay crop in every livestock section of the Middle and Far West destroyed. The bulk of the oats crop was beyond salvage other than emergency grazing, although it furnished scant feed. In the dairy sections, milk yields shrank as cost of maintaining herds rose.

This, the most severe drought in North American annals, will exert a profound influence on the food supply of the nation. In a few brief weeks the surplus food theory was dissipated. Official effort is diverted to conservation and repletion of stocks previously considered a handicap to agrarian prosperity.

Probably the most serious consequence is dearth of roughage, portending diminished milk and meat production. Loss of the oats crop will not be severely felt if the corn harvest assures reasonable abundance, but the prosperous brewing industry faces barley shortage. Fruit prospects have not been seriously impaired and it is probable that poultry production will be equal to that of recent years, as corn-belt farmers made strenuous efforts to replace with avian product the reduction in pork necessitated by participation in the government control plan.

Illinois and the twin Dakotas have felt the brunt of this prolonged arid period that had its focal point in the latter States two years ago. At the corresponding period of 1933 the entire corn belt was waterlogged, followed by a dry summer, with grain yields materially reduced. Illinois was invaded by chinch bugs—an aggravation that crossed the Mississippi River into Iowa early this summer—a corn-crop menace more serious than drought in many sections. In the grazing area west of the Missouri River, pastures were ravaged by other insect pests, not the least ruinous of which is the Mormon cricket, presumably so named because of its fecundity. Fortunately, disappearance of the corn borer in Indiana, Ohio and Michigan makes a normal corn crop possible east of Chicago.

At mid-June the whole country from the Alleghanies to the foot of the Rocky Mountains and from Texas to Montana, although relieved by local showers, was still dry. Minor watercourses had disappeared, small lakes over the Great Plains had evaporated, and even the major streams carried the smallest volume of water since the middle nineties of the last century. Dust storms obscured the sun, piling up drifts on highways and fence corners.

Fortunately the Mountain States, well wooded and watered, have not suffered severely. The expansive Flint Hills and Osage pastures in southern Kansas and northern Oklahoma were in condition to furnish refuge for thousands of distressed Southwestern cattle of both sexes and various ages; such cases as the sandhills of Nebraska and the Crow reservation in southern Montana have been immune to Nature's tyranny and in smaller isolated spots both water and grass were always available.

While results are serious, publicity has been surcharged with exaggeration, creating an erroneous impression that an old-time Western "die-off" was in progress, ignoring the fact that during half a decade of climatic vicissitudes the Plains area has gradually reduced its bovine herds, so that caring for the residue is not a serious problem. When nature returns to a benign mood, restocking will be imperative, bringing realization that no beef-cattle surplus exists in the trans-Missouri region.

Such dairy States as Wisconsin, Minnesota and northern Illinois, where the dairy industry has been overdeveloped, are disgorging "boarder" cows by the hundred thousand, but even that movement promptly contracted when pastures revived in early June. Apparent increase in beef production, indicated by recent cattle slaughter figures, is actually liquidation—a draft on future supply.

Effects of the drought up to mid-June may be thus epitomized:

Increased slaughter of low producing and tubercular dairy cows, a logical and gratifying development in view of expansion of that industry during the past decade; consequent excess milk production and demoralization of the industry.

Premature slaughter of thousands of yearling steers and heifers, calves of the 1933 crop, as a result of hay and pasture scarcity, coupled with shortage of stock water locally. This also reflects a general disposition among feeders to pocket profits, reversing their 1933 policy, when they refused to take losses, carrying the

crop into excessive weight and precipitating the débâcle of October to January.

Slaughter figures this year probably will exceed the 1933 record, but marked deficiency in beef tonnage is inevitable, as the proportion of long-fed steers will be small.

Denuded pastures and a doubtful corn prospect have restricted feed-lot replacement. Winter beef production will depend on the outcome of growing corn, because the old crop surplus will be at the vanishing stage by September, when the fate of the new crop will be determined meanwhile by physical conditions and the initial killing frost. Roughage scarcity caused by a short hay crop may be relieved by corn fodder and a large acreage in soy beans.

Present indications are that a good corn crop will be garnered east of Chicago; Illinois, between drought and chinch bugs, will have the smallest yield on record; Iowa has an excellent prospect of a normal crop; Nebraska and Kansas will both be short. In any event, cheap corn is impossible, without which the great army of in-and-out feeders will not operate.

Between the corn-hog reduction plan and short pastures, pork production is being substantially reduced. All through May every market in the country was congested with famished spring pigs that realized less than the processing tax. Each pig represented one less fat hog later on and thereby insured a premium on weight if the residue of the crop is to be fed out. Illinois and the Dakotas will have few mature hogs during the fall and winter period. Nebraska and Kansas also will be delinquent in weight, if not numbers.

Native lambs are going to the butcher prematurely, for they represent grass utilization. Western lamb production will be short on tonnage, probably in numbers, and, in all probability, winter feeding in the corn belt will be sharply reduced.

Not only livestock but all the cereals, milk and vegetables will be scarce and realize more money. Loss of the oats crop will put a burden on corn.

While the A.A.A. program, popularly known as the "New Deal," cannot be saddled with responsibility for this calamity, the consensus of agrarian opinion has undergone a radical change toward that policy during the last three months. Processing taxes, with implied benefits in the case of corn and hogs, are now regarded with suspicion, when not actually anathematized. Washington has been deluged with requests for reduction or cancellation. Prediction that hog producers rather than pork consumers would pay such taxes has been verified by winter and spring hog prices reduced to $3 per hundredweight on the farm.

Latent hostility fairly blazed when Washington seriously proposed embracing cattle in the scope of the process-tax program. From early January, when this project was put up to the American National Livestock Association at its annual convention in Albuquerque, N. M., until June, when Wyoming and Montana unanimously rejected it, the cattle atmosphere was surcharged with denunciation. Texas sidestepped the issue; Kansas and Nebraska registered emphatic refusal to go along, even when threatened with a so-called compensatory tax as an alternative.

Only one gathering, at Des Moines, Iowa, voted assent. That result aroused State-wide indignation over the Hawkeye State, expressed at innumerable local meetings, and at the Chicago (Sherman Hotel) conference late in May, culminating in an outburst of resentment that forced the managers to pass action along to a committee, the alternative being loss of face. At least, until the pending A.A.A. drought-relief program has been worked out, the obnoxious cattle-processing tax will repose on a dusty shelf.

* * *

Drought invariably heralds actual or relative scarcity with higher prices. Assuming that in this instance scarcity will be relative, not even semi-famine results are probable. Already millers, packers and food processors generally are viewing the prospect with concern. Elimination of surplus agricultural products will solve for some time a troublesome, if not exaggerated, problem. Probably the next task confronting the guardians of the industry will be rehabilitation, especially of the livestock phase.

At best, the scope and severity of the Mid-West drought can be only partially depicted by photographs of actual conditions. Near Gregory, S. D., soil from the fields drifted like snow across roads and around buildings during the big wind storms. At this point near Lyons, Ill., the Des Plaines River in normal years is 8 to 10 ft. deep and fills its bed from bank to bank. In northwest Wisconsin dairy cattle were slaughtered or driven to better pastures hundreds of miles away.

Packaging American Cheese in Cans

By L. A. ROGERS
Chief of Research Laboratories
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U. S. Department of Agriculture
Washington, D. C.

Domestic Cheddar ripens naturally in the container with no loss of moisture and no rind formation

Fig. 1—Valve-venting the can allows natural gases to escape, but keeps the container airtight, thus providing a satisfactory package for American Cheddar cheese. Canning is said to eliminate shrinkage and waste, normally amounting to about 10 per cent.

PACKAGING unprocessed American Cheddar cheese in cans has for some time been considered possible, but, due to technical difficulties, has not been developed commercially. However, by means of a process developed in the U. S. Bureau of Dairy Industry, it now becomes fully practicable. The process has undergone stringent tests during the past two years, has been finally approved and has been recently announced to cheese manufacturers and consumers.

The method overcomes two difficulties experienced in previous attempts to can cheese. It provides an airtight seal, necessary to prevent the growth of molds and the loss of moisture with a consequent rind formation; it also allows the carbon dioxide given off in the ripening process to escape, which in all former attempts caused the unvented can either to swell or to burst. These results are attained by means of a one-way, or check, valve which opens under low pressure, holds perfectly against external atmospheric pressure, and adds little to the cost of the can. A number of different types of valves have been tried on experimental work, but in most of the commercial work only this one type has been used (Fig. 2). The small quantity of air held between the cheese and the can is soon absorbed without any visible mold growth.

This development is an important step toward the elimination of certain difficulties in the way of the cheese-making industry. American cheese has always been pressed in cylindrical form in sizes varying from the "Young America," weighing 11 lb., to "Cheddars," weighing up to 70 lb. The most popular styles are "Daisies," weighing 22 lb., and "Flats," weighing from 30 to 33 lb. each. The industry has always been handicapped by these inconvenient sizes and shapes. Even the smaller sizes must be cut by the retailer into smaller and irregular units, which dry up rapidly, and, on account of the tendency to exude fat, present an unattractive appearance if they are not kept cold.

A material loss of weight results from evaporation during the ripening period, and an additional loss occurs in cutting the larger cheeses, especially those that are well ripened and tend to crumble. These losses are estimated to total about 10 per cent of the bulk of the cheese. In terms of total production of domestic cheese, which amounts to nearly 500,000,000 lb. per annum—three-fourths of which is American Cheddar—the losses from evaporation and cutting are possibly 50,000,000 lb.

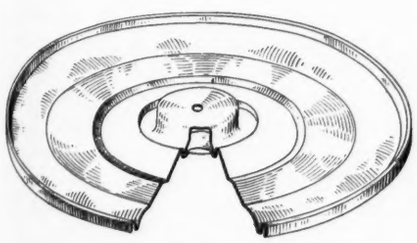
Slicing also is disadvantageous to the manufacturer, as his identity is lost even before his product reaches the retailer. The creamery operator making a fancy butter can cut his print into quarter pounds, wrap each neatly in parchment, and inclose the four pieces in an attractive carton. On the package he may print the name of his factory and any other advertising he may care to add. The best that any of the cheese makers have been able to do is to market through a cooperative selling organization which stamps a brand on the rind, so that each cut will bear at least one imprint.

Heretofore, the only commercial method for putting Cheddar cheese into a more attractive and convenient form is the one known as processing. After the rind is removed, the cheese is ground, a small quantity of water and an emulsifier—usually sodium citrate—are added, and the mass is heated with constant stirring until it becomes fluid. The emulsion is run into forms, which in many cases are wooden boxes lined with tinfoil, in which it is sold. The cheese

hardens quickly and, as the wrapping adheres closely, there is no trouble from molding. Moreover, as the temperature to which the cheese is heated is high enough to constitute pasteurization, most of the bacteria are killed and the enzymes destroyed, so that the ripening is stopped. In this process, much of the original character of the cheese is lost; but, in spite of this objection, the advantage of the package is so great that a large part—possibly one-third—of all the cheese made in the United States is sold in this form. The efforts to put the natural or unprocessed cheese into similar packages have usually consisted in cutting the ripened cheese into prints and wrapping in such a way that air is completely excluded from the surface. Various combinations of waxes have been used to reinforce the wrapping, but, while some of these have seemed promising, none of them has come into commercial practice.

In making cheese to be packed in cans, the curd is pressed in hoops to give it the required form and size. The usual practice is to press the cheese in hoops forming a loaf of the right diameter to fit the can, but as long as practicable. The following day the cheese is taken from the hoop, the cheesecloth bandage removed, and the long loaf cut into lengths to fit the can.

Cross-Section



Courtesy Continental Can Co.

Fig. 2—Natural gases thrown off by the cheese press up through the hole in the under side of the top, raising the rubber disk and escaping under the edge of the covering cap. When there is no pressure from below, the disk returns to position and covers the hole, the sole entrance for outside air.

Wrapping in Cellophane or parchment paper is advisable to protect the cheese from discoloration where it comes in contact with the seam of the can or with other unprotected metal. A lacquered can is essential even when the cheese is properly wrapped, for traces of sulphurated hydrogen, which tends to blacken metals, may be among the gases produced by the bacteria in the cheese.

The cans are sealed at once, packed in the shipping boxes or cartons, and stored in the curing room, which, for the finest Cheddar flavor, should be held at 45 or 50 deg. F. Faster ripening may be obtained at 60 deg. F., but a higher temperature is very inadvisable.

Although the labor of pressing in small hoops is greater than in large forms and the wrapping and sealing is an extra expense, it is partly offset by the fact that once the cheese is in the cans and stored in the curing room it requires no more attention until it is ready for shipment. The regular Cheddar styles require paraffining, frequent turning on the shelves, and protection against skippers, mice, and other vermin.

The added cost of canning, over marketing in the usual package, may be estimated at from $2\frac{1}{2}$ to 5 cents a pound. This, of course, will vary materially with the size of package adopted. Offsetting these increased costs are prevention of loss due to evaporation of water during the curing and of loss due to cutting into retail packages.

The extra labor of pressing will be reduced by the design of special hoops that can be filled and emptied quickly. In a large-scale operation the wrapping and canning will be done by machinery. It is probable that in many cases the canning will be done in a central plant to which the curd will be brought by truck from a number of factories.

Almost any style of package can be used. Half-pound or 12-oz. prints in a can 4 in. in diameter make a satisfactory package for retail. One distributor plans to use a can containing a number of pound or half-pound prints wrapped separately. This can will be opened by the dealer and the single package dispensed to customers. Large cans holding 5 to 10 lb. may be used, and even the Daisy style has been canned successfully. However, much of the advantage of canning is lost when cans larger than the individual consumer size are used.

A print with a cross-section of about $3\frac{1}{2}$x$3\frac{1}{2}$ in., suitable for sandwiches, may be sealed in a No. 5 can; but, since this leaves an appreciable air space, it will be necessary to displace the air by an inert gas such as carbon dioxide. If the sale of this type of package warrants, a square can undoubtedly will be developed.

So far as we have been able to determine, the cheese ripens in the can exactly as it does in the normal loaf, except that there is no loss of moisture and no rind formation. The retention of moisture probably causes a slightly faster rate of ripening and a softer texture.

In canning Cheddar cheese it will be necessary to guard against certain difficulties. Even careful selection of the milk for cheese making and of the curd for canning does not invariably insure a perfect mature cheese. A dealer who has established a brand probably will find it necessary to dispose of offgrade cheese under another label or through other channels. This may make it advisable to use labels to be put on the can after the cheese is ripened rather than lithographed cans.

Producers of canned cheese probably will encounter complaints from people who suppose that, because the cheese is sealed in a can, it need not

(Turn to page 338)

Fig. 3—Although canning American cheese is now practicable in containers holding up to 10 lb., 8- and 12-oz. cans will likely be most convenient for retail trade use.

Air Infiltration

Complicates Traveling-Hearth Bake-Oven Design

By G. R. FENNEMA
Baldwin, N. Y.

PRODUCTION of bakery products, particularly bread, on a volume basis at a low unit cost was the incentive for the adoption of the traveling-hearth oven. The first ovens were of a heavy brick construction and the fuel commonly used was either coal or coke. Natural gas was sometimes used in those localities where it was very cheap.

As the furnaces of all ovens, the peel as well as the traveling-hearth type, were rather simple, even crude, in construction and were operated with hand firing and under natural draft, they lacked automatic control of temperature. Consequently, attainment of even an approximation of uniform oven temperature was possible to attain only because the ovens had the heavy brick construction.

Much time was required to heat up this massive brickwork to any great extent. When it was once heated the oven temperatures were held fairly uniform by careful operation of the draft and check dampers.

Peel-Oven Performance Desired

With the hope of duplicating the performance of the best peel ovens for baking variety bread, the first traveling-hearth oven was designed with the longitudinal construction as illustrated in Fig. 1. The conveyor in this oven was run on an incline. The object was to inject the steam at the lower end and let it travel with the movement of the bread; become superheated in its travel to the delivery end; and leave the oven at this point.

This performance would have been nearest to duplicating the steam period in the peel-type oven, and would have worked out quite satisfactorily if the builder had provided an apron of steam-tight construction on the delivery end of the oven down to the level of the top of the loading opening. This device would have balanced the static head of air on both ends of the oven.

As this point was overlooked, a head of air of over one foot in height was created between the ends of the oven. The draft set up caused such a flow of cold air of infiltration through the baking chamber that it became impossible to bake a good loaf of bread in the first traveling-hearth oven. In the peel oven the bread is baked with the doors closed so that there can be no infiltration of cold air.

Eventually the oven represented by Fig. 1 was torn down to the foundations and on top of the existing furnaces an oven of brick construction, but with a conveyor of the raised type (Fig. 2), was erected. This conveyor construction was for the purpose of raising the bread into a pocket where superheated steam would surround the loaf, just as in the peel oven. Such construction would have been all right provided the oven doors were kept closed during the baking period; in a continuous operation such is impossible.

This oven baked bread of better quality than did the first one. However, the distribution of the steam remained a difficult problem. The air infiltration through the open doors was the same as in all present ovens, and only by use of excessive steam and heat could the effect of air infiltration into the ovens be partly overcome.

● At least three highly important factors are involved in the designing of a bake oven. They are: the means by which the oven is loaded and unloaded; the manner in which the baking heat is applied and maintained to give a finished product of uniform quality; and the structural details that assure the desired baking conditions with the lowest fuel and construction expense.

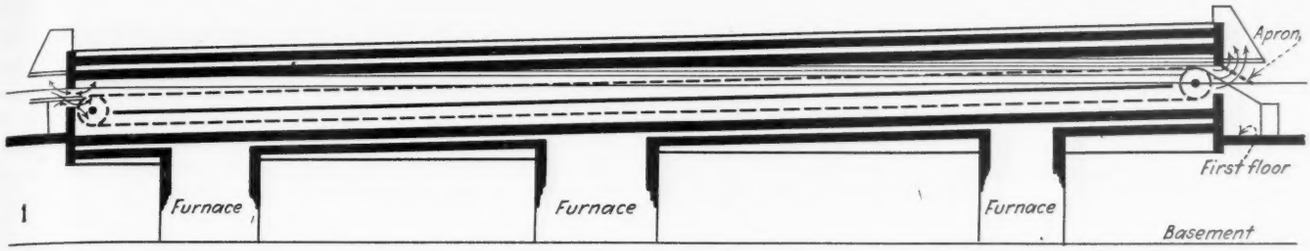
● The first two factors were thoroughly discussed in the recent series of articles on bake ovens by Harry Carlton (Food Industries, November and December, 1933; and January, March, and April, 1934). The third factor, which is a highly controversial subject, was to a very large extent left open for discussion by others.

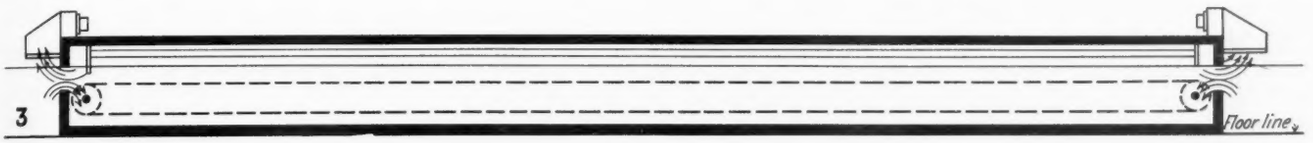
● In this article, the second of his series, G. R. Fennema discusses those details in the construction of traveling-hearth ovens which in his opinion are most significant in the types used by the baking industry in recent years.

Drying Action Excessive

Because of these difficulties, this type of brick-constructed traveling oven is now almost a thing of the past. From an engineering standpoint the reason can best be illustrated by the following example. Suppose one has an oven baking 5,000 lb. of dough per hour. The shrinkage of the products is 10 per cent, or 500 lb., per hour. The steam injected is 50 b.hp. (1,500 lb.) per hour. Also keep in mind that at 202 deg. F. a pound of dry air saturated with vapor can contain 2.8023 lb. of vapor. Thus 2,000 lb. of vapor per hour can be carried away by 710, $\left(\frac{2{,}000}{2.8023}\right)$, lb. of dry air per hour (11.83 lb. per minute). In small tray-type ovens I have found at various times as much as 40 lb. of air infiltration per minute.

This feature in oven construction is easily demonstrable. One can test his oven by holding a sheet of paper as long as the oven mouth is wide and about 10 in. in width in front of the oven and by watching the paper drawn inside the oven near the bottom. When holding it near the top, watch the effect of the outflow. Blow some smoke between the paper and the opening and note the velocity of its movements. One is safe in saying

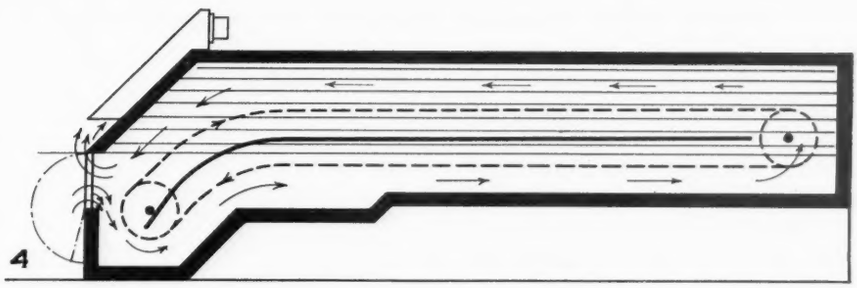




1 In a traveling-hearth oven with an inclined conveyor an important detail in construction is the need for a steam-tight apron at the delivery end to equalize the head of air at both ends of the oven.

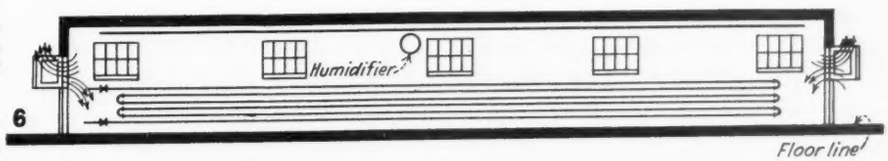
2 Traveling-hearth ovens with a raised conveyor construction require an excessive quantity of steam and furnace heat to offset the effect of air infiltration. Air currents set up by passage of the pans of dough through the oven unbalance the heads of air at the ends of the oven.

3 Travelers with a straight or level conveyor construction are good ovens for the baking of crackers, pretzels and similar products that require considerable drying. Air infiltration is particularly troublesome to bread baking in this type oven.

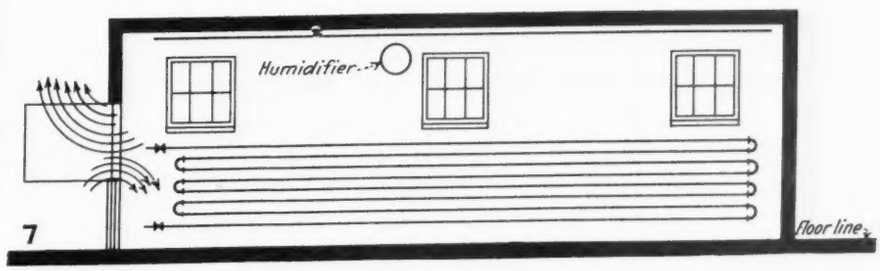


4 Unless special precautions are taken, the conveyor system in single-lap traveling-tray ovens helps to set up a circulation of air into and out of the oven even though the oven has only one door opening.

5 Peel ovens with an inclined loading-front hearth are similar in construction to a hot room in which the inclined floor at the entrance reduces the head of the heated air and thereby tends to prevent its escape from the room and replacement by cooler outside air.



6 Travelers are similar in construction to a hot room in which openings in opposite walls are level with or above the heating elements. As these openings are always open, cool outside air enters through the openings, becomes heated, and on expanding forces heated air out through the upper part of the opening, thus setting up circulation air currents that cause a continual changing of air in the room.



7 A hot room having a construction similar to the single-lap traveling-tray oven differs from that in Fig. 6 only in that it has a single opening instead of one in each of two opposite walls.

that to date air infiltration and proper gaseous fluid conditions in the baking chamber have been entirely neglected in any design of traveling-hearth and tray ovens by any and all designers.

Another important quantity of air infiltration takes place when the windows in the bake shop are opened for the sake of ventilation. Even the slightest amount of difference in static pressure thus created will blow all heated vapor out of the oven into the shop. A great difference in static pressure is not necessary to cause a considerable flow. For instance, a pressure difference of 0.05 in. of water will cause a flow of 896 ft. per minute traveling the length of a 100-ft. oven in 0.11 minute—equivalent to more than 10 miles per hour. I have seen ovens so located that opening a window was all that was necessary to blow all the heat out of the oven.

Moisture-Absorbing Air Cools

Such air infiltration causes a marked cooling effect on the product; the quantity is difficult to estimate, as the actual conditions are unknown. However, the fact remains that partly saturated air at ordinary temperatures will drop approximately 8.5 deg. F. for every grain of moisture absorbed by each cubic foot of air, as in any continuous dryer.

In a tunnel dryer, for instance, the air before heating is 90 deg. F. and contains 40 grains of moisture per pound of dry air. If the air be heated to 300 deg. F. it will still enter the dryer with 40 grains of moisture per pound. In traveling through the tunnel dryer it will pick up moisture and, if the air leaves the tunnel 70 per cent saturated, its temperature will have dropped to 118 deg. F. and it will contain 310 grains of moisture per pound of dry air. The product in the dryer also will be 117 deg. F., not any higher, although the air enters at 300 deg. F. dry bulb temperature.

The range or temperature drop in the dryer is 183, (300 — 117), deg. F. The pick-up is 310 grains — 40 grains = 270 grains per pound; 19.65, $\left(\frac{270 \text{ grains}}{13.7 \text{ lb. per cu.ft.}}\right)$, grains per cubic foot of dry air at 90 deg. F. in this case is equivalent to a drop of 9.8, $\left(\frac{183}{19.65}\right)$, deg. F. per grain of moisture absorbed per cubic foot of air.

How much of this same drying action occurs in the tunnel bake oven no one knows exactly. But one may be sure that the quantity of air infiltration and the movement of air through the baking chamber caused by the uneven static condition on the ends of the ovens, together with the unbalanced conditions caused by the injection of steam into the oven, make it impossible to create anywhere near the same gaseous fluid conditions as can be produced in a properly designed peel hearth oven.

"Baking in a chamber filled with vapor, which comes from the baked loaves and the injector steam, produces a crust that is crisp and tender —never hard or scaly. The doughs readily absorb the steam injected into the baking chamber and produce a firm, large loaf that weighs considerably more than if baked in an inferior oven," is the claim of a leading manufacturer of peel ovens.

There is no doubt that with the drying effect of the air of infiltration eliminated the products will shrink less during baking; elimination of the cooling effect of air of infiltration also shortens the baking time, which in turn cuts down on the loss of moisture.

Fig. 3 shows the longitudinal section of a straight conveyor tunnel bake oven used mostly as a direct gas-fired oven. The atmosphere in this type of oven is the product of the combustion of 1 part of city gas to 4 or 5 parts of air, or 1 part of producer gas to 1.8 parts of air, plus, in each case, the hot air of infiltration.

Some Products Require Drying

The drying effect in this type of oven is sufficient to make it a good oven to bake crackers and matzos, shredded wheat and such products which should receive a good deal of drying. As for bread—especially steam-finished bread—it is a failure.

One time an oven manufacturer told me that bread should be baked in its own vapors of evaporation, which is my conviction also. Then he went ahead and patented a direct-fired gas oven of which he sold several and with which he practically loaded one baking company. This baking company without exception used to turn out the best loaf of bread on the market, but is now in no position to make a genuine steam loaf at many of its plants.

Fig. 4 illustrates the longitudinal section of a single-lap traveling-tray oven of the latest type. Although the oven has only one door opening, the air infiltration is very great. The door, shown closed in the sketch, is, of course, always open when the oven is operated. The air cannot blow through the oven as in a tunnel type bake oven, for there is only one door.

Yet, as the air in the shop at 90 deg. F. has a volume of 13.7 cu.ft. per pound of dry air and the mixture of superheated steam and air at 500 deg. F. has a volume of about 37 cu.ft. per pound, this difference in weight and the height of the door produce quite a draft which may be readily calculated. The cold air streams into the oven over the lower sill of the door opening, is heated up to oven temperature and leaves at the top of the opening. While this air of infiltration passes over and around the products in the process of baking it is subjected to the same cooling and drying effect as in the tunnel oven.

Vapors Escape Into Bake Shop

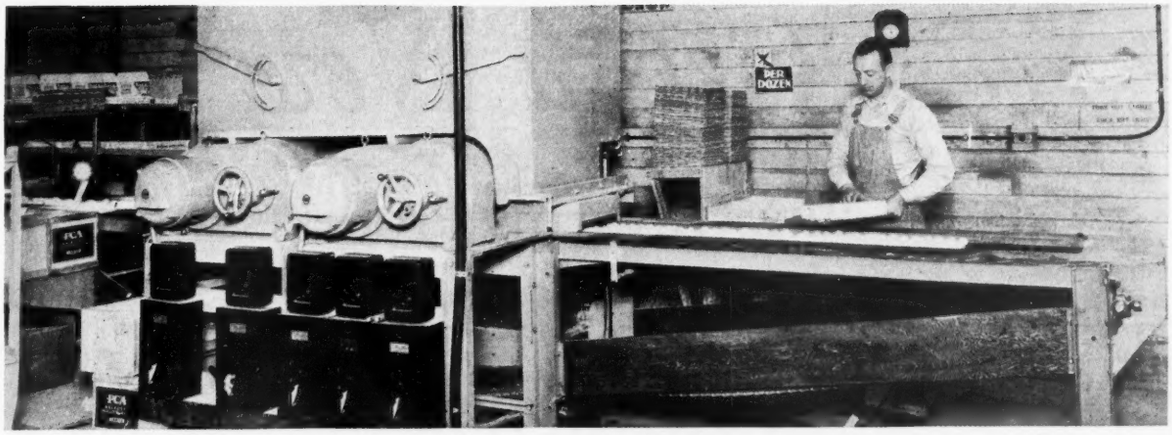
Injection of steam is a great problem, as steam injected at atmospheric pressure has a volume of about 26.82 cu.ft. per pound. It is lighter than the air entering the oven but considerably heavier than the superheated vapor and air in the oven. Therefore it finds a ready escape out of the oven into the bake shop, assisted by the flow of air produced by infiltration. As this steam and gas escape from the oven they are discharged into the face of the operator. Often an attempt is made to catch this gaseous vapor in a small hood over the door, but in reality it escapes mostly into the shop for the great comfort (?) of all, especially on a 96 deg. F. summer day.

More can be written on advantages to be gained through the elimination of all air infiltration from the baking chamber proper, and how shrinkage of material may be lessened. Perhaps a better understanding will be gained through comparing these different type ovens with similarly constructed hot rooms.

Fig. 5 represents a small building or room provided with fairly tight door and windows. It has an incline in the floor, is heated by steam coils on wall and ceiling, and is provided with a small humidifier which keeps the air circulating. As it is of good construction, it should be no trouble at all to maintain at any desired inside temperature and relative humidity, as long as the door stays closed, even at zero outside weather conditions. This illustrates, in the same light, the peel hearth oven as long as the door is kept closed.

Also, in the case of the peel oven,

(Turn to page 322)



Forking eggs, 3 doz. at a time, onto the conveyor. Sanding machines that now handle 45,000 eggs per hour are operated by six electric motors with a total capacity of only 20½ h.p.

Cleaning Soiled Eggs

With a Sandblast

SANDBLASTING might seem to be rather rough treatment for eggs, but, with the blast nicely tempered to requirements, this method of cleaning soiled eggs has become a valuable aid to poultrymen.

At first these soiled eggs were washed by hand; then mechanical washers were employed to some extent. Washing by any method, however, is undesirable because, once the shell is dampened, its protective qualities are partly destroyed — washed eggs do not keep as well as do those in the "clean" classification.

About twelve years ago, experiments were begun in California with a machine for "dry-cleaning" soiled eggs by a sandblasting process. This method has the advantage that it does not wet the shell and hence the egg will keep almost as well after the treatment as it did before; not quite, however, as loss of the "bloom" or membranous covering is a disadvantage.

Design of the sanding equipment has been improved in recent years and machines recently have been built to handle as many as one thousand 30-doz. cases per eight hours with an accuracy of control that gives a high percentage of cleaned eggs with negligible breakage and remarkably slight attrition of the shell. A lead-pencil mark placed on the shell of an egg before sanding is still visible after the treatment.

In operating the sanding machines used by the cooperative egg producers on the Pacific Coast, the eggs are received in side-opening 30-doz. cases. An attendant uses a wooden fork for lifting each 3-doz. layer of eggs out of the case. The fork takes the filler and the eggs, leaving the flat in the case. After resting the loaded fork on the continuous conveyor of the sanding machine, the attendant gently removes the fork from beneath the eggs and then lifts off the separators. As shown in the accompanying picture, the conveyor consists of an endless series of rubber-covered rollers on which the eggs are free to roll continually as they pass through the machine, thus exposing all surfaces to the sandblast.

Inside the sanding compartment the eggs pass through a steady "rain" of clean, white sand whose velocity on impact with the eggs can be controlled accurately within desired limits. The sand is fed from a hopper at the top of the sanding chamber, whence it moves by gravity into a rotor type feeder that forces it downward in a uniform spray, or "rain," to the eggs on the conveyor. An exhaust fan beneath the conveyor maintains a near vacuum, which is highly important in preventing the escape of sand or dust and also keeps the sand moving on down into a separator. This device, employing the centrifugal principle, separates dust and broken sand particles from the clean, coarse grains, which are then returned to the hopper above—to be used again.

The velocity of the sand grains and the speed of the conveyor are varied in accordance with the degree of cleaning to be done, the "light dirty" grade requiring much lighter treatment than the "heavy dirty" grade. After the treatment ordinarily given the former grade, 75 to 90 per cent of the eggs are clean; from 50 to 75 per cent is considered a good average for complete cleaning of the "heavy dirty" grade.

In a sanding machine designed for a capacity of 1,000 cases per 8-hour day (45,000 eggs per hour) the power ratings of the motors driving the various parts of the mechanism are as follows:

½	hp. driving conveyor which carries the eggs;
15	hp. (3 motors) driving feeders which control intensity of sandblast;
3	hp. driving exhaust fan beneath conveyor;
2	hp. driving blower to drive separator and lift sand back to hopper on top.
20½	hp. Total

On leaving the sanding compartment the eggs begin their journey down a 35-ft. length of the conveyor along which are stationed attendants, usually women and girls, to perform the several operations of candling and classifying, the first of which is to grade out those eggs that have not been sufficiently cleaned. A sanding machine handling 500 cases in eight hours will keep twenty attendants busy. Such a machine with stations for these attendants can be installed in a space 63 ft. long by 15 ft. wide.

Yeast Gets a New Job

The Olivarius Process For Recovering Sucrose From Blackstrap Molasses

By W. H. YOUNG
San Francisco, Calif.

IN the usual method of cane-sugar manufacture, the sugar is obtained from the cane juice by a process of concentration and crystallization, usually in three steps, or "strikes," as they are generally known in the raw cane-sugar industry. As each strike is made, some sugar is obtained. The first strike produces the most and best sugar; the last, or third, strike produces the lowest grade. After each strike the mother liquors from which sugar crops are removed become more and more impure until the impurities are so great that no more sugar will crystallize from the solution, and an end-product known as "waste molasses," or "blackstrap," results.

The Olivarius process proceeds in the opposite manner. From this very impure product — waste molasses — most of the interfering impurities are removed and then the sugar is recovered. The largest individual impurity—invert sugar—is removed in this process by selective fermentation with a special yeast which does not invert or ferment the sucrose. After fermentation, alcohol and lime are added. This treatment precipitates a large quantity of the other impurities, which are removed by subsequent filtration. The alcohol is recovered, and the sugar is then crystallized from the purified, de-alcoholized syrup.

The process is, therefore, one of simple fermentation, filtration and distillation. It is not revolutionary in any respect. The necessary equipment is well-known standard sugar and distilling equipment.

The point of interest about the Olivarius process is that it starts with a waste product, recovers the most valuable constituent—sucrose—and, at the same time, produces two valuable byproducts: alcohol and the press cake. From each ton of molasses treated there is produced from 5 to 15 gal of alcohol; the quantity depends upon the quantity of the fermentable sugars in the molasses. Also from each ton of molasses there is produced about 500 lb. (dry basis) of press cake. This press cake is valuable as a fertilizer, having been appraised by the Hawaiian Sugar Planters' Association as having a value of over $10 per ton.

Some idea of the importance of the process to the sugar industry is well illustrated by the following figures:

Normally, the world production of cane sugar amounts to about 18,000,000 tons. In the production of this quantity of sugar there is also produced approximately 5,000,000 tons of waste molasses, which contains, on an average, 35 per cent sucrose, or, roughly, 1,750,000 tons. Even at today's low price of sugar, this 1,750,000 tons of sucrose in the world's waste cane molasses has a value of over $100,000,000 yearly. In the past, sugar companies and others have spent fortunes in an attempt to recover at least part of this huge waste, with little success.

Strangely enough, credit for the development of this process falls outside the sugar industry. It goes to the research department of the California Packing Corp., which is under the supervision and direction of its director of scientific research, Charles S. Ash. The process is fully protected throughout the world with patents owned by the California Packing Corp. Young & Co., Ltd., is a company formed for the express purpose of licensing and demonstrating the process to the sugar industry. This company has demonstrated the process in Puerto Rico, Peru, Philippine Islands, Hawaiian Islands, Mexico, Cuba and the United States.

Details of the process center around the two steps: (1) removal of invert sugar; (2) removal of organic, non-sugar impurities.

The buffering action of the mineral salts and some of the organic impurities in the molasses inhibit action of the invertase upon the sucrose

TABLE I—Results Obtained by Treating Molasses From Various Parts of the World

	Before fermentation but after dilution				After treatment by the Olivarius process			
Kind of Molasses	Deg. Brix	Per Cent Sucrose	Per Cent Glucose	Purity	Deg. Brix	Per Cent Sucrose	Per Cent Glucose	Purity
Cuban	44.00	21.07	7.13	47.90	40.00	27.16	trace	67.90
Florida (not diluted)	88.40	31.97	29.42	22.40	31.70	18.17	less than 0.10	55.52
Haiti	47.60	19.26	14.35	42.02	24.70	20.21	0.72	81.82
Louisiana (refinery waste)	45.08	16.00	9.40	35.40	40.05	19.40	1.50	58.34
Philippine	43.00	17.55	12.78	34.88	31.20	22.22	0.20	67.95
South African	43.20	19.25	7.67	41.2	32.14	20.66	0.30	62.30

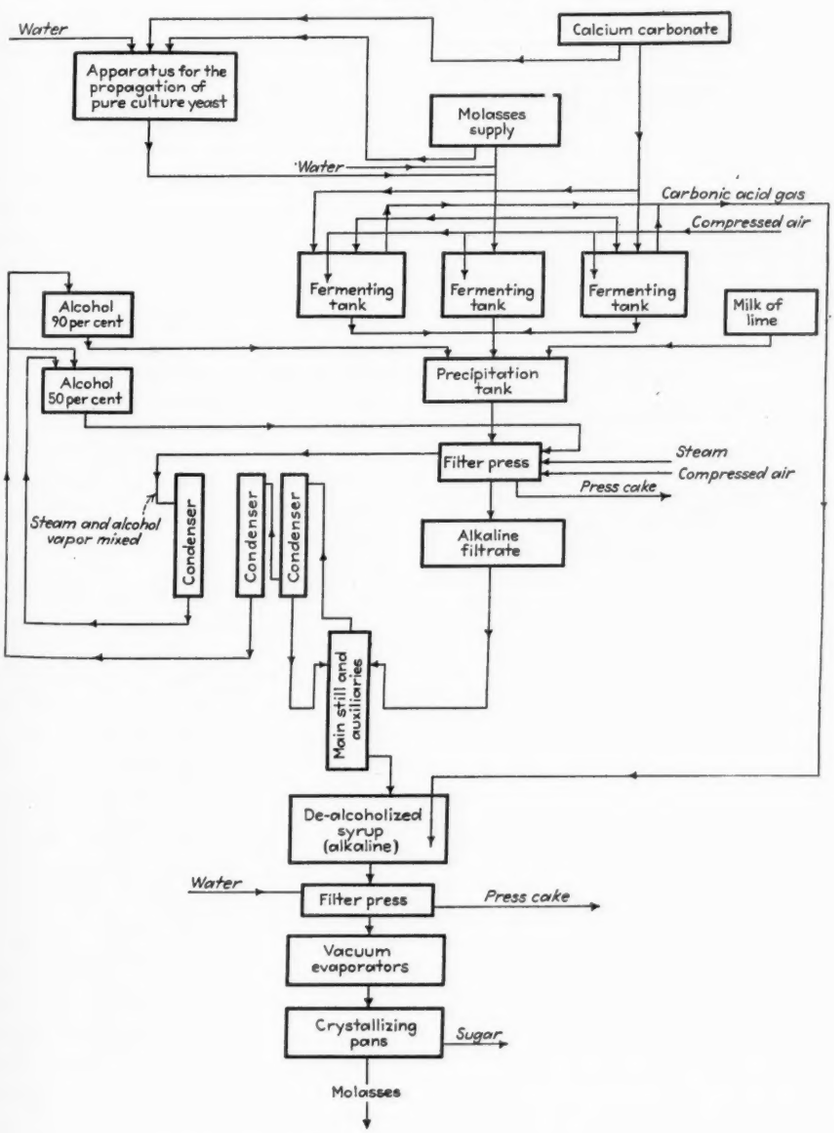
content of the molasses. Also the concentration of the molasses plays an important part. There is little danger of sucrose inversion if the molasses is fairly heavy; dilution to 45 to 50 deg. Brix worked fairly well. However, adjustment of the pH at 6.3 to 7.0 with ground limestone is made as a further precaution. Yeasts capable of working in concentrated molasses are necessary. The best temperature for fermentation is about 30 deg. C.

When the fermentation has proceeded to the desired point the invert sugar will have been reduced to about 3 per cent, or until there is no further decrease in invert sugar content and no decrease in sucrose content.

At this stage of the fermentation operation the molasses is mixed with an equal volume of 85 to 90 per cent alcohol. To each 100 gal. of this mixture is added 7 gal. of 20 per cent (CaO) cream of lime, with agitation to precipitate the organic non-sugars.

The quantity of lime to be added will vary, of course, with the composition of the molasses. It is essential that the cream of lime be passed through a fine screen, as its action is increased with its surface. The action of the lime is prompt and the bulk of the precipitate is formed at once. However, small quantities of precipitate will continue to form for some time and for that reason it is advisable to let the mixture stand until the next day before filtering. Table I illustrates how the process works on several types of molasses.

Production of Sugar From Cane Molasses by Olivarius Process



Jellying Power of Fruit-Juice Extractions

(Concluded from page 305)

a relative viscosity of the juice is 6, 0.81 oz. of sugar must be added to each ounce of fruit juice; and the mix, sugar and juice, must then be evaporated by boiling to a final weight of 1.35 oz. per ounce of fruit juice to form a satisfactory jelly.

By making use of the pipette and this table of relative values the method of making up jellies from extracted juice is as follows: (1) The viscosity is measured; (2) the extracted juice weighed; (3) the sugar, the quantity given in the table multiplied by the ounces of juice used, added to the juice; and (4) the sugar and juice mix boiled down to a definite final weight—the weight found in the table multiplied by the ounces of juice used. The completion of this final step is determined easily by weighing the pan and its contents while boiling hot.

Some fruit-juice extracts naturally need more acid to bring them into the jellying range. Juices having a viscosity of less than 4 need more pectin. A commercial pectin may be added to these, after which the viscosity should be measured again if use is made of this new method. Juices with a viscosity greater than 12 should be diluted with water and the viscosity again measured.

Quantitative relationships given in the table will fit the needs of commercial jelly manufacturers as well as home economic teachers. The decimal point may be moved about at will. Also pounds may be used instead of ounces. However, the relationships are not necessarily fixed, as the manufacturer may find by experience that the viscosities he determines will require somewhat less sugar, because of large batch cooking. Furthermore, he wants a slightly stronger jelly to withstand shipping treatment. A manufacturer might well use kettles which can be weighed at all times. Such a kettle hook-up can easily be devised by utilizing flexible steam fittings. Boiling to a definite final weight does away with all other methods of determining the finish of the cook.

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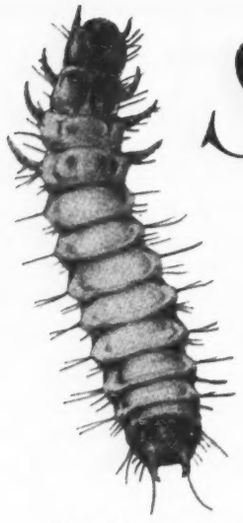
1. L. W. Tarr, Del. Agr. Exp. Sta. Bull. No. 134, Tech. No. 2.
2. P. B. Myers and G. L. Baker, Del. Agr. Exp. Sta. Bull. No. 149, Tech. No. 8.

Storage Beetles

Are Among Food Plant's Worst Pests



Cadelle larva

Tobacco beetle

Larger cabinet beetle

Drug-store beetle

Yellow meal-worm beetle

By HARRY STINER
New York, N. Y.

BEETLES, which infest perishables, possess several points in common that are not generally shared by moths, roaches, flies, ants and the like. They are for the most part uniformly elliptical, noticeably convex on top and flat beneath. The rear and greater portion of their bodies usually is completely covered with a pair of hard, firm wing covers, under which—when these beetles can fly—is a pair of thin, folded wings. Like moths and flies, they have four distinct stages of development—egg, larvæ (worm), pupa (transforming stage) and adult—and are full grown when they emerge as adults. But, unlike moths and flies, they live a comparatively long time in the adult stage and are always destructive to the food materials they contact. They are, as a rule, only slightly more resistant to the effects of pest-control measures, but, due largely to their retiring habits and their ability to penetrate dense objects during both of their active stages, they will very frequently escape injury from a certain control measure when all other types would be destroyed. For this reason and the rather unpleasant fact that storage beetles constitute a larger variety than all other storage insects combined they may easily be listed as one of the worst food-plant pests.

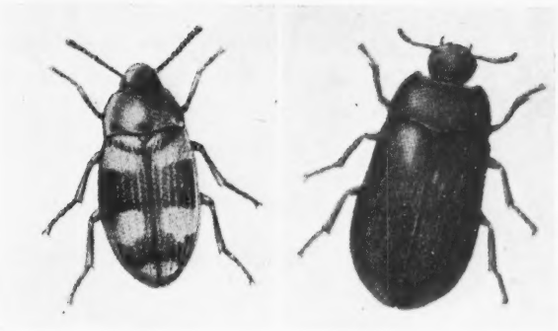
The so-called "dried-fruit beetle" is primarily a follower of fermentation in plant products, such as decaying fruits and vegetables. The adult is about $\frac{5}{32}$ in. long, hard, robust, black with two pale-brown spots on its back, and can fly. The larvæ are soft, yellow wormlike forms about $\frac{1}{4}$ in. long, and do much of the damage caused by this pest. The adults attack and deposit their eggs upon fermenting fruits and vegetables in the field or on the drying trays. When first-quality fruits are near they also become infested and the insects are then carried into the storage bins. Once inside the plant, the emerging adults will deposit their eggs on any susceptible material and the infestation continues.

Control of the dried-fruit beetle should begin outside of the plant. The purchase of dried fruits should always include the specification that they be free of the dried-fruit beetle in any form. This precaution should be followed by rigid inspection upon receiving. Infested or formerly infested material will show signs of having been eaten away if old or tightly packed. It will contain insect frass and frequently an occasional dead adult or larvæ. Also, when the infestation is of recent date, many of their microscopic eggs will be lying about. If the fruit has not been thoroughly fumigated, these eggs are still capable of hatching out unless kept in cold storage. Of course, the activity of the insects ceases when they are subjected to cold-storage temperatures, and they will eventually die from it. However, this method does not remove the beetles, and, as with all beetles, they are still "bugs," dead or alive. Infestations of dried-fruit beetle developing in or around susceptible materials in normal temperature storage may be stopped by fumigating all infested containers separately and thoroughly spraying the occupied space as well as surrounding articles, or by fumigating the entire space and its contents (Formula No. 8*). The dried-fruit-beetle larvæ disrupt the natural cellular arrangement of the fresh fruits and cause premature decay. Both stages destroy the dried product and litter it up with their dead bodies and frass. Consequently such infested fruit in storage usually has little value as a food and should be discarded.

The "bean weevil" is not a true weevil. Although all weevils belong to the beetle family, these are weevils in name only. The one most commonly encountered in food plants is about $\frac{1}{8}$ in. long, fairly active and robust, but more flattened on top than the average beetle. It is of a velvety gray or brown color with red legs, and does not possess an elongated snout, as do the true weevils. The larvæ are soft, whitish, legless grubs (worms) which develop entirely within the bean, and from which the adults finally emerge by gnawing their way through the skin. Both stages destroy the product. The principal food of the bean weevil is beans, although it will attack stored

*FOOD INDUSTRIES, April, 1934; pp. 160-162.

Many varieties bedevil the food man with pest-control problems and make heavy inroads upon his stock of perishables.



Left, two banded fungus beetle
Right, black fungus beetle

peas when near. It prefers warm, damp and unfrequented places, and long-stored materials where they will seldom be molested. They breed continuously throughout the year in warm favorable spots, produce many generations a year, and eventually reduce the beans to mere shells and frass if not stopped.

Like the dried-fruit beetle, the original infestation of any certain lot usually starts in the field, where the eggs are laid on the ripening bean. When new crop material is bought it should be purchased as weevil-free and followed up by rigid receiving inspection. Control measures within the plant generally consist of fumigating or heat-treating the filled containers and spraying the section occupied, or fumigating the entire room (Formulas Nos. 8 and 9*). When an infestation becomes thoroughly established it usually is impossible to clean the foodstuffs satisfactorily and they should be destroyed. Rigid inspection of the beans when being received and frequent inspection all during their storage period will often avoid considerable loss and trouble.

The drug-store, cigarette and cabinet beetle group represents many similar varieties and has the unique if not commendable reputation of feeding on cereals and cereal products, sweet goods, and dried animal materials. In food plants they may be encountered in seeds, grains, cereals, cookies, cakes, biscuits, roots, herbs, spices, wool, hair, leather and all similar materials. They are equally liberal in their distribution, being rather common in all climates. They breed rapidly and when once established are certain to cause serious and widespread damage if not controlled. They are equipped with wings but prefer long-stored and unmolested materials and are not generally inclined to migrate unless crowded.

The drug-store beetle is about $\frac{1}{10}$ in. long, robust, hard, of a brown, fuzzy appearance, and fairly active. Its head is bent beneath its body and is invisible from above. The larvae are soft, white, hairy worms which are accountable for most of the damage caused by the beetle.

Dark meal-worm beetle

- **In the two immediately preceding articles of this series cockroaches and the more common flour and grain beetles have been discussed as to life cycle, habitat, food and method of extermination or holding in check.**
- **Other varieties of storage beetles are equally objectionable in and destructive to food materials. They, in some cases, are rather difficult to keep under control and their damaging infestation to a minimum.**
- **For the killing of some of these pests sodium fluoride and sodium arsenite are used. These chemicals are poisonous to humans as well as insects. Health regulations in some cities and States prohibit their use in food plants. Before using these and other poisons be sure they are permitted—and then be very careful how they are handled.**

The cigarette beetle so closely resembles the drug-store beetle in appearance and habits that they may well be taken as one and the same in general food-plant control. They may be commonly encountered in similar foods; however, the cigarette beetles have at times won additional ill-repute by their attacks on stored tobaccos.

The cabinet beetles vary in size from $\frac{1}{16}$ to $\frac{1}{8}$ in. long, are hard, robust, black and covered with varying quantities of brown, yellow or white scales or hairs until a mottled effect is produced. They possess small heads which protrude forward instead of down, as with the two preceding types. Their larvæ also are soft, white, wormlike forms and cause most of the damage done by the beetles.

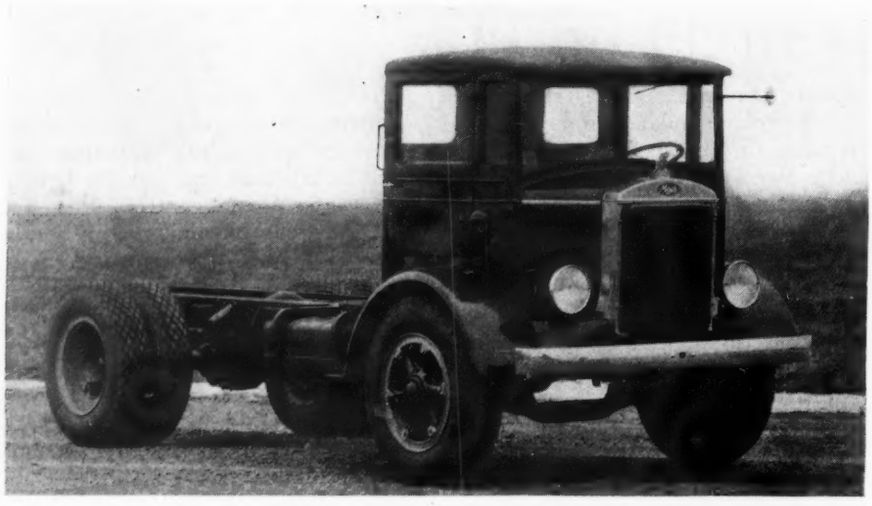
Cadelle adult

The most important part in the control of these pests is frequent inspection, as most of the materials they attack are not customarily held in cold storage. Infested raw materials, clothes and equipment can be sprayed, fumigated or heated, but

(Turn to page 338)

Two New Trucks for Food Field

Effect of Legislative Restrictions Seen in New Mack Models—Walker Electrics Entirely Redesigned for Speed in House-to-House Milk or Bread Deliveries



One of the new Traffic Type Macks with the cab over the engine to provide one-third front and two-thirds rear axle distribution of gross weight to better meet legislative restrictions.

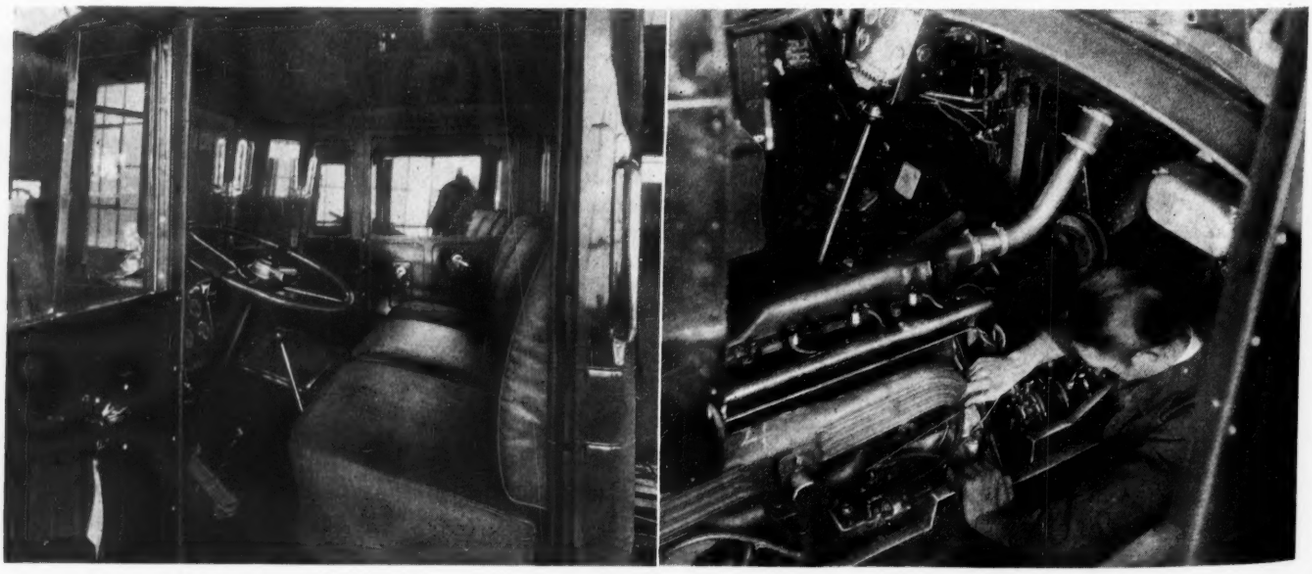
LAST YEAR it was predicted in FOOD INDUSTRIES that the tendency of State legislatures to limit axle loads as well as gross vehicle weights would result in changes in truck design by means of which a larger per cent of the gross load would be carried on the front axle. It was further pointed out that by this means, with the rear axle carrying its maximum load, the gross allowable weight would be increased and thus help to reduce the unit haulage cost of the load carried.

Among the most recent motor trucks following such principles of design are the two new heavy-duty cab-over-engine Macks lately put into production by Mack Trucks, Inc., New York, N. Y. The two new models, designated as the Traffic Type, each save 3 ft. in length over the corresponding conventional engine-under-hood models, besides providing one-third front- and two-thirds rear-axle distribution of gross weight.

Because of this more equitable distribution, gross weight within specified axle-weight limitations has been increased. On the same maximum authorized tires, the new Mack Model C H, rated at 3 to 5 tons, can carry 1,100 lb. more than its conventional counterpart, while the new Model C J, rated at 3½ to 6 tons, will carry 1,200 lb. more than its conventional mate.

The increase of only 5 per cent in gross weight ratings on the new models is explained by the fact that the corresponding conventional models already carry 30 per cent of the gross weight on the front tires because of their set-back front-axle construction. In addition, the new Traffic Type models gain in maneuverability in congested areas by a 5-ft. reduction in turning radius by reason of their shorter wheelbases for given body lengths.

In other respects the new models



Left, interior of the Mack Traffic Type cab, showing wide seats and convenience of controls. Right, mechanic standing between cab sill and frame with engine exposed by raising the engine housing and removing the right toe and floor boards.

follow usual Mack design except in the construction of the cabs. These, however, retain the driver-comfort features of the Mack coupé cabs manufactured for other models. The general characteristics of the Traffic Type Macks, their cabs and the means of ready engine accessibility are shown in the accompanying illustrations.

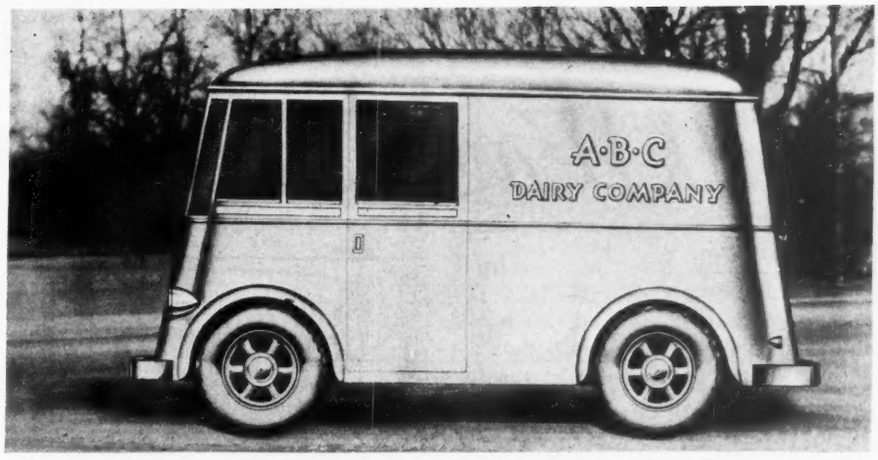
New Light-Weight Walkers

An appreciable weight reduction; a low-speed, high acceleration drive for house-to-house service or a high-speed drive for general deliveries; unobstructed load space; semi-streamline bodies and low price are the features of the new Walker ¾- to 1-ton electric trucks.

They are made in two models, one with a straight frame and one with a dropped frame to provide a low-aisle truck especially adaptable for retail milk, bakery and grocery service. They are made in Chicago, Ill., by the Walker Vehicle Co., a division of the Yale & Towne Mfg. Co.

From the viewpoint of the food-field truck user, the engineering design of the new Walkers, and especially the low-aisle model, is of interest because the reduction in weight gives greater size of battery. The new rear-axle drive gives quick-starting acceleration and maximum road speeds of from 16 to 21 miles per hour.

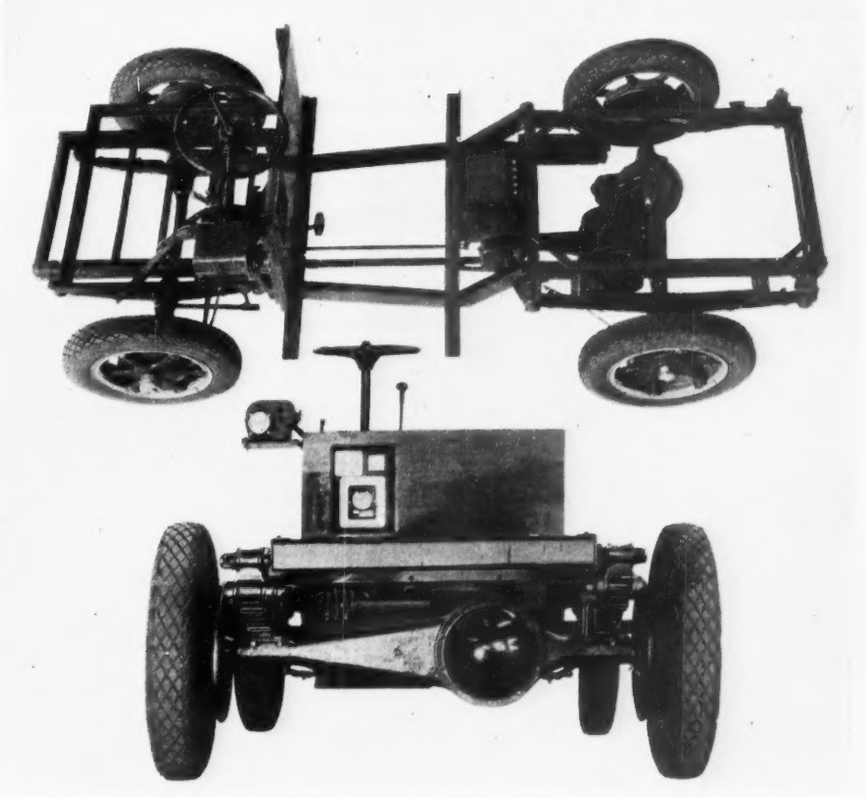
As shown in one of the accompanying views, the entire battery is located above the frame at the front of the chassis. This leaves the remainder of the chassis free for the widest possible choice of body designs and an unencumbered, low aisle for easy access. The pressed-steel channel frame is riveted and welded, thus giving a wide range of frame lengths; low-aisle widths and the location of the aisle in the frame length to suit almost any given body requirement.



One of the new Walker low-step electrics designed especially for house-to-house milk and bread deliveries and distinguished by its new semi-streamline body with slanting front and rear, good driver vision, and front and rear bumpers.

The higher road speeds are due in part to the new rear-axle design, in which the new high-speed motor is mounted on the axle housing parallel with the axle.

Bendix four-wheel mechanical brakes are standard. There are only fifteen grease fittings on the entire chassis and no part requires lubrication more often than once a month. All spring bolts and shackles are rubber-bushed.



Two views of the new Walker house-to-house electric truck chassis. Top—Plan view, showing better cradle in front, dropped-frame in center and new type rear axle at right. Bottom—Rear view of chassis, showing arrangement of new rear axle.

Philco Batteries In All Types

ALTHOUGH not described in the battery article in our May issue, FOOD INDUSTRIES is advised that Philco starting, lighting and ignition batteries in full lines for passenger cars and motor trucks and power batteries suitable for electric truck propulsion are made by Philco, Battery Division, Philadelphia, Pa.

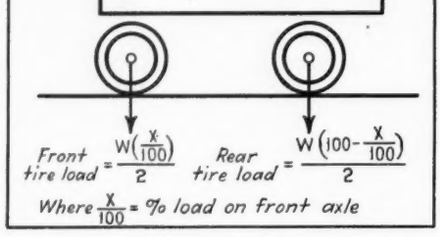
The Philco cell is characterized by the use of a distinctive diamond grid plate made in a hollow channel section. By the Philco process the active material is forced in place from within the channel and held by the flat bases of the triangular-shaped diagonal members which are staggered on opposite sides of the grid.

Some Fundamentals on Mounting

Milk Wagons on Pneumatic Tires

THE milk company executive who must O.K. the bills for mounting his wagons on pneumatic tires should be certain that his men in charge of the work have satisfactorily answered the following questions: (1) Are tires of the proper size? (2) Are wheels of the proper diameter? (3) If anti-friction bearings are used, are they of the proper size? (4) Has the floor of the wagon body been lowered as much as possible? (5) Do hubs protrude beyond the line of the outer edge of the tires? Unless the fundamental items of construction enumerated in the above queries have been taken care of, the resulting work will not give the greatest satisfaction or lowest expense.

The size of the tires is determined by the combined weight of the wagon and its load, including ice, if ice is used during the summer months; the distribution of the combined weight between the front and rear axles and the carrying capacity of the tires. The latter should all be of the same size on a given wagon for servicing simplicity. If the tire loadings are different on the two axles, the larger tire to carry the heavier loading should be selected.



Diagrammatic sketch showing how to calculate the proper size of pneumatic tires for retail milk-route horse wagons.

The method of selecting the proper size of tire is shown in the accompanying illustration. The combined weight of the wagon and its load, designated as *W*, may be obtained by weighing the loaded wagon on a convenient coal-yard scale.

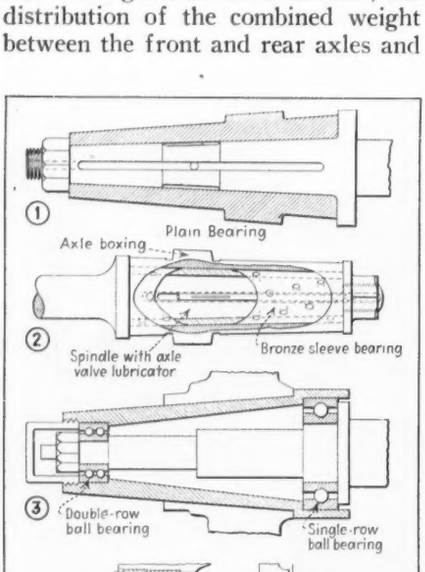
That percentage of the total weight which is carried on the front axle may be obtained by weighing the front end of the wagon separately with the front weels on the scale and the rear wheels off it. The difference between the total weight and that on the front axle is the weight on the rear axle. The front and rear axle weights each divided by two gives the respective tire loadings.

Then by consulting one of the tire data books furnished by practically every tire company the proper size of tire may be selected as that tire whose carrying capacity is equal to or slightly greater than the larger of the two tire loadings.

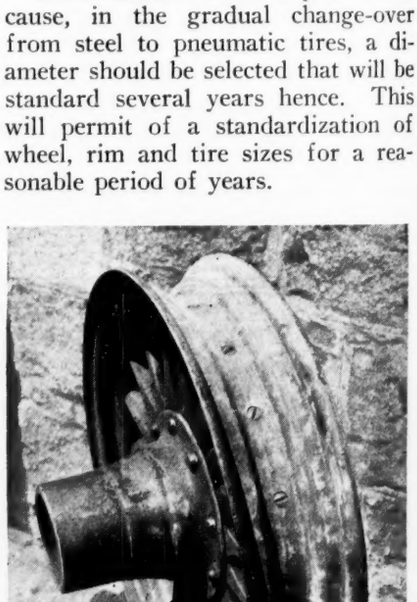
For example, suppose the weight of the wagon is 1,700 lb. and its load of 30 cases of iced milk at 84 lb. per case is 2,520 lb. This gives a combined load of 3,220 lb. If 45 per cent of the load is carried on the front axle and 55 per cent on the rear axle, the respective loadings are 1,450 lb. and 1,770 lb. These totals divided by two give tire loadings of 725 lb. and 885 lb. Looking in the tire data book, it is found that a 5.50x18 tire has a carrying capacity of 940 lb. at 30 lb. air pressure and is the theoretically proper size of tire.

This theoretically correct size may be modified under certain conditions. If a company's equipment is now partly motorized, with a majority of the trucks using a different size of tire and it is planned to use worn motor-truck tires which have smooth treads in place of new tires on the horse wagons, the truck size of tire should be selected. Such worn tires, while they have no non-skid value on trucks with four-wheel brakes, should render satisfactory service on horse wagons because of the latter's slow speed and small daily mileages.

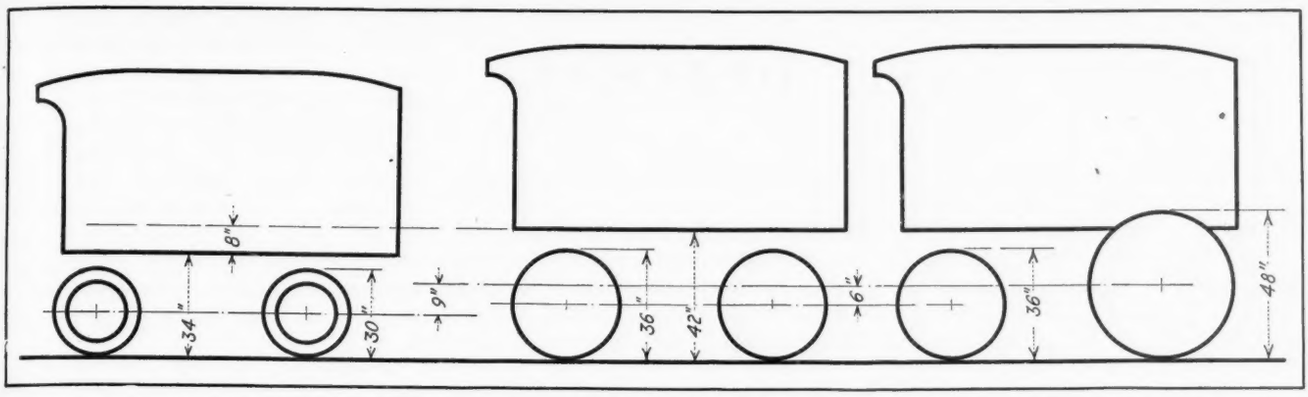
Wheel diameters are important because, in the gradual change-over from steel to pneumatic tires, a diameter should be selected that will be standard several years hence. This will permit of a standardization of wheel, rim and tire sizes for a reasonable period of years.



Four different methods of mounting wheels on pneumatic-tired horse wagons. Reading down, No. 1 shows a plain-bearing axle; No. 2, a bronze sleeve-bearing axle as provided by the Axle Valve Co., Chicago, Ill.; No. 3, a ball-bearing wheel; and No. 4, the roller-bearing wheel hub as furnished by E. Teel & Co., Medford, Mass.



An old wagon hub and wheel with the latter cut down to fit the pneumatic tire rim. Note how the latter is attached to the ends of the wooden spokes by screws, which are likely to work loose by successive wettings and dryings and result in a wobbling wheel and excessive tire wear.



Evolution of the pneumatic-tired horse wagon. Right, the original steel-tired wagon with two sizes of wheels and axles at different heights from the ground. Center, the wagon with wheels of same size as the steel-tired front wheels. Left, the pneumatic-tired wagon with much smaller diameter wheels. While all dimensions given are approximate, the drawings indicate how the floor of the pneumatic-tired wagon can be lowered at least 8 in. to reduce driver fatigue.

The trend in automotive-type wheels has been steadily toward smaller diameters. While the 20-in. wheel has become a popular size in recent years, it is being replaced by 18-in. wheels, which are being made a standard stock size that can probably be obtained from several sources at no price premium for several years.

This discussion of wheel diameters brings up the question as to the relative merits of cutting down the old wagon wheels or discarding them and substituting new automotive-type wheels. The pioneer company in change-overs, the Whiting Milk Cos., Boston, Mass., followed the procedure of discarding the old wagon wheels entirely. There are now in service more than 200 Whiting pneumatic-tired wagons, all fitted with automotive disk-type wheels at the plant of E. Teel & Co., Medford, Mass.

Cutting down the old wagon wheels and fitting pneumatic-tire rims is supposed to save money as compared with buying new wheels. Any saving in this connection is doubtful, especially if any type of anti-friction hub bearing is to be used.

The cutdown wheel has one important disadvantage of weight, some such wheels weighing as much as 20 lb. more than an equivalent automotive-type wheel. In addition, it is necessary to attach the steel rim to the wooden spoke ends by means of screws. The screws are likely to loosen with alternate wetting and drying and may become dangerously loose. It is difficult to attach the rim so accurately that the wheel will run true and prevent wobbling.

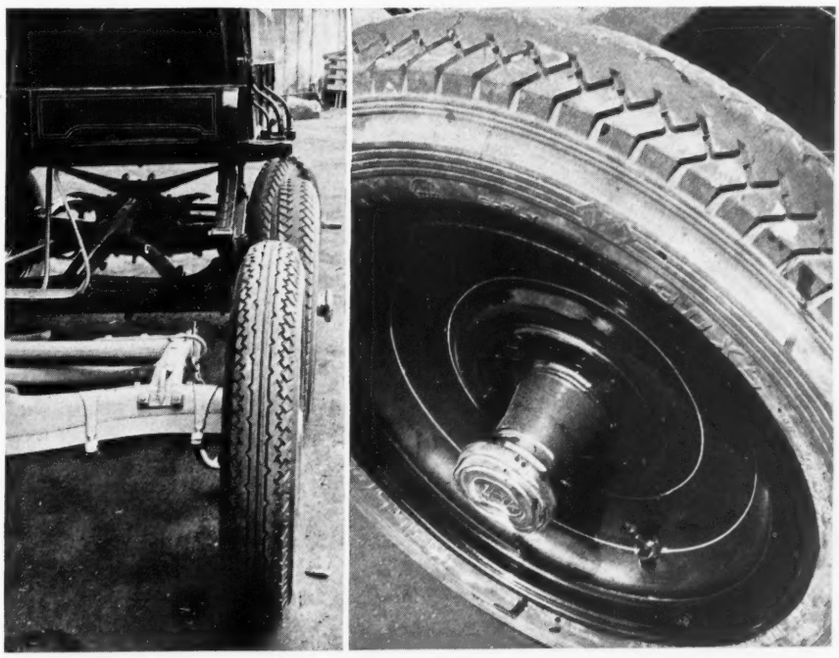
All automotive-type wheels are carried on some form of anti-friction bearings, so that, if these are desired, the automotive-type of wheel is preferable for that reason alone. Automotive-type disk wheels are rigid; resist damage in accidents, and are easy to clean.

There is still considerable difference of opinion as to the necessity of changing to some form of anti-friction bearing, and if so, whether it should be a sleeve-valve bearing such as made by the Axle Valve Co., Chicago, Ill.; a ball bearing, or a roller bearing. Additional bearing data will be presented in a subsequent issue of FOOD INDUSTRIES.

No matter which type is used, care should be exercised to see that the bearing is neither too small nor too large. The wheel load should be checked with the bearing capacity as given in the bearing manufacturer's data book.

With the use of pneumatic tires even smaller in diameter than the front wheels of the steel-tired wagon, the change-over should give a wagon with a floor at least 8 in. lower than before. The floor should be as low as possible to help reduce the driver fatigue.

If automotive-type wheels are used, with the hub caps dressed up for appearance, care should be taken not to have them protrude beyond the edge of the rims. Otherwise the caps will need continual repair. With all four hub caps the same height from the ground on a pneumatic-tired wagon, protruding caps on front and rear axles easily get damaged in moving in or out of line in the stable or passing through doorways.



Left, in background, one of the Whiting wagons showing how the hub cap protrudes beyond the tire. In foreground, front axle and shafts of Teel design with hub cap entirely within the outside edge of the tire. Right, one of the mashed Whiting hub caps.

LIQUID WASTE DISPOSAL

(Concluded from page 299)

the screens are devices for measuring and controlling the flow of waste. On account of the layout of this plant it is necessary to treat the tomato waste with a separate system of screens the operation of which is similar to that of the general waste screens. The material removed from these screen tanks is hauled away in dump wagons and spread on fields.

After leaving the screens, the general waste is pumped directly to a group of four ponds which can be operated singly or in series. The screened tomato waste passes through a presettling pond and then combines with the general waste and is pumped to the storage ponds. These have a combined capacity which is sufficient to retain the wastes, under conditions of maximum flow, for a period of about twelve hours. These ponds, as well as the concentrated waste ponds which are adjoining, are about four feet deep and were formed by earth embankments built up from shallow excavations. Slip scrapers were used in their construction. The tomato-waste presettling pond was already on the plant property and is somewhat larger and deeper. The ponds are cleaned by hand after the season is over. A surprisingly small amount of material accumulates in them.

The settled wastes, which by this time are not only fairly free of suspended solids but are also somewhat reduced in strength, due to fermentation action, flow next into an oxidation ditch. This ditch, which also is simple in construction, is about a mile long, is shallow, about one foot wide at the bottom, and has a gradient of one to one thousand. The waste at the average rates of flow is about three or four inches deep.

The ditch winds back and forth on the plant property, so that its mile of length is actually concentrated in a fairly small area. The purpose of this oxidation ditch is to expose the already settled and partly purified waste to the air and sunlight so that oxygen may be absorbed into it. In such a ditch, algae and bacteria will develop which will feed on the organic material and further supply oxygen to the waste, thereby hastening purification. The effluent material leaving the ditch is here mixed with the plant cooling water, which affords considerable dilution, and is then discharged into the creek. It is possible to discharge the concentrated waste into the ditch also, or it can be discharged directly to the receiving stream by means of a bypass ditch. The material from the four settling ponds also can be bypassed directly to the creek. This bypass is provided so that the ponds may be emptied rapidly when there is a flood.

This system of disposal, then, is based upon three principles: (1) separation of the small quantity of strong waste from the more dilute general waste and the storage of this concentrated material; (2) the practice of good housekeeping within the plant so that as much waste material as possible may be removed in a semi-dry state; (3) the controlled use of natural methods of purification, after removing the solids by screens.

This treatment system cost only about one-fourth as much as a trickling filter system. And the cost of operating and maintaining it is low enough so that any canner should be able to afford it. Tests made at various times indicated that the strength of the waste was reduced about 70 per cent, exclusive of an undetermined reduction effected by separation of the concentrated wastes and by the practice of good housekeeping.

It should be possible to apply these principles of design and construction in whole or in part to almost any canning-factory-disposal problem. It may be that the separation and storage of the strong wastes will alleviate pollution in some cases; in others, perhaps, screening in addition to storage of strong wastes will be sufficient; or it may be necessary to employ the whole scheme of treatment, or even to go further by the use of longer ditches. As a final step, where very complete treatment is necessary, chlorine can be used as a sterilizing agent.

Air Infiltration Complicates Traveling-Hearth-Oven Design

(Concluded from page 312)

if the hearth is in good condition, one may produce almost any desired gaseous fluid state inside the baking chamber.

Fig. 6 represents a building about the same size as a large traveling-hearth oven. This building is provided with two Dutch doors, one on either end. The building is heated by means of steam coils on walls and ceiling. The windows represent the openings for shafts and take-up boxes, light boxes and peepholes. A humidifier is installed within, and the upper parts of the Dutch doors, which are the full width of the building, are opened and inserted in their places are gratings with 33 per cent openings.

In outside zero weather one would have a fine time maintaining any temperature under such conditions, not to speak of relative humidity, in this building. And if we had excess heating surface and very large humidifier to keep up with the losses, where would we be when the wind started to blow against one of the doors?

One may say that all this is very obvious and too stupid to talk about. That is granted. We picture zero weather and 80 deg. inside temperature; a difference of 80 deg. F.

Notwithstanding the above is a true picture of the difficulty to maintain any uniform condition in all tunnel ovens—a feat which is far more difficult, for here we work under more trying conditions in that the range in temperature between air in shop and oven is nearer 400 deg. F. instead of 80 deg., as in the example.

Thus Fig. 6 may well represent the oven shown in Figs. 2 and 3.

Fig. 7 represents the sketch of a building conforming with the tray oven shown in Fig. 4. The sketches explain themselves and do not need any further comment, as the story is the same as the tunnel type.

It comes simply down to this: One would not want to bake in a peel oven with the door open; why, then, expect to make good in a traveling-hearth oven with the door open?

In a subsequent article one solution to this air-filtration problem will be discussed and illustrated.

NEW BOOKS

COST AND PRODUCTION HANDBOOK. Edited by L. P. Alford. Assisted by 80 contributors. Published by the Ronald Press Co., 15 East 26th St., New York, N. Y. 1,600 pp., Bible paper, 5x7; flexible leather; illustrated. Price, $7.50.

ANYONE who will read all of the 1,600 pages in this very exhaustive handbook will become very well acquainted with the best practice of the day in all phases of costing and industrial engineering. But because it is a handbook, it will be used largely as a reference. Of especial value are the sections devoted to job and method standardization, rate setting, and incentive methods.

Although the background of most of the contributors to this book has been largely the non-food industries, particularly the automotive industries, most of the management and engineering knowledge is applicable to all forms of food manufacture.

SWEET MANUFACTURE. By N. F. Scarborough. Published by Leonard Hill, Ltd., 231-2 Strand, London, W.C. 2, England, 1933. 123 + XI pp., 5⅞x8¾; cloth; illustrated. Price, 7s. 6d.

WRITTEN by a mechanical engineer, the contents of this book should dwell more on the equipment and mechanical operations essential to candy making than on the technological phases. However, an attempt is made to give the likely causes of trouble in actual operation and to tell how they may be avoided or remedied. The feature of this small book is that it gives American candy makers some pointers on how English candy is made. The chapter on prevention and utilization of waste is novel in that most books on food products and their manufacture do not appear to recognize the possibility of any waste.

THE BOOK OF STAINLESS STEELS. By Ernest E. Thum. American Society for Steel Treating, 7016 Euclid Ave., Cleveland, Ohio, 1933. 631 + XII pp., 6½x9¼; cloth; illustrated. Price, $5.

WHILE the greater part of this collection of authoritative information on stainless steels deals with the fabrication and properties of the steels, there is much pertaining to their applications. Manufacturers of food and particularly of equipment to be used in food manufacture will find helpful the chapters on finishing and fabricating operations, welding, duplex materials, properties of the typical alloys, and particularly those of Part III discussing the requirements of the consuming industries. Each chapter is prepared by a specialist on the subject discussed. The book is the first to describe American usage and practice relative to stainless steels. A classified list of these steels, giving trade names, composition and manufacturers, is included.

MANUFACTURE OF WHISKEY, BRANDY, AND CORDIALS. By Irving Hirsch. Sherman Engineering Co., 437 Frelinghuysen Ave., Newark, N. J., 1934. 133 pp., 6¼x9⅛; fabricoid; illustrated. Price, $10.

SINCE the removal of statutory barriers to the production of alcoholic beverages there has been a growing literature pertaining to their manufacture and preparation for the market. The quality of the information contained in the publications has been improving as the more technically trained and sound thinking men in the alcoholic beverage field assume the rôle of authorship.

From them we learn that every step in the manufacture and conditioning of all malted and fermented beverages, whether they are distilled liquors or not, must be safeguarded by the proper selection and treatment of raw materials and by the use of the correct equipment if the resulting finished products are to attract the consuming public.

Between the selection and initial treatment of the raw materials by trained and experienced technicians and the enjoyment of the finished beverage by the bon vivants there is a gap that must be spanned by those who know the proper procedure and equipment that should be used.

It is the process engineer who must bridge this gap. The day of the tradition-bound, rule-of-thumb, "been-in-the-business-since-a-boy" expert nearly ended during the prohibition period. Practically a new generation is at the management end of the old, old industry which has so suddenly become a colicky new industry. Recognizing this fact, the author of this book, who is a chemical engineer well versed in process industrialism both on the American and the European continents, has compiled this reference guide containing methods for processing and installation layouts for equipment which will provide for the profitable manufacture of high-grade malted, fermented, and/or distilled beverages. From explanatory definition of the type of beverage in question to its label regulations and government practices relative to its marketing, every processing step and each piece of processing equipment is given and, where possible, illustrated. The beverages dealt with are: whiskies, brandies, applejack, slivowitz, rum, gin, liqueurs and cordials. Included in the book are discussions on ingredients and raw materials and on useful critical tables.

WORLD SUGAR PRODUCTION AND CONSUMPTION, AN ECONOMIC GEOGRAPHICAL SURVEY. By D. J. Robertson. Published by John Bale, Sons & Danielsson, Ltd., 83 Great Titchfield St., London, W. 1, England. 142 pp., 5x7; cloth. Price, 5s.

TO TREAT on so vast a subject as world sugar in so small a compass as this volume precludes a very exhaustive discussion of the subject. There is, however, a great deal of valuable information contained within this volume which should be well understood by all who purchase sugar in quantity as well as all who are actually in the business of manufacture or refining of sugar.

Although the book is admittedly addressed to the economist, it reads very much like a commercial geography. Geographical factors, such as climate, rainfall, labor supply, soil types, and similar geographical factors are described and evaluated. Probably the best feature of the book is the analysis of possibility of expansion of the many sugar-producing areas throughout the world.

A PRACTICAL ANALYSIS OF SOME FUNDAMENTALS OF INDUSTRIAL POWER TRANSMISSION. Prepared and published by the Mechanical Power Engineering Associates, 684 St. Marks Ave., Brooklyn, N. Y. 39 pages, 11x8½; paper; illustrated. No charge.

ALTHOUGH this analysis is a piece of promotional literature, it contains so much sound engineering information of interest to all production men, particularly those who are studying the cost of modernization, that it deserves mention in this page devoted to new books. In analyzing the problem of driving machinery, the cost of direct versus group drive is too frequently overlooked. For example, a 40-hp. motor costs $313, but 40 hp. in ½-hp. motors costs $2,720. Supplementary equipment, such as fuse boxes and starters, also are important elements of cost to be recokoned with. Much practical information is presented regarding proper drives for groups of equipment on production lines, and flexible methods of hanging castings.

THINGS HAVE HAPPENED . . .

- *N.R.A. goes on big food code spree*
- *End of Congress blocks legislative blows*
- *Quotas put sugar industry on an even keel*
- *Confectioners do a little New Deal analysis*
- *Macaroni industry to get tough with violators*
- *Cereal chemists, operative millers meet*

Seven Major Food Codes Signed; Master Code Being Redrafted

Having finally made up its mind as to what to do about the food codes, N.R.A. within the last 30 days approved fair trade practice pacts for eight major and two lesser food processing trades. And simultaneously with this action, it withdrew the long-awaited and much-heralded master food code from the skirmish lines and put it under the knife. The big code didn't look right to many of the small industries and, besides, N.R.A. decided that it did not represent a majority of the industry. While the master code remains on the operating table, codes for the smaller trades are being held somewhat in abeyance. Indications are that N.R.A. wants a general code covering hours and wages for these smaller industries.

Bakers Get What They Want

The industries which came under codes in the recent N.R.A. splurge include baking, milling, canning, preserving, candy, cocoa and chocolate, wholesale confectionery, bottled soft drinks, ice cream cones and malt products. The bakers came out of a revolution against N.R.A. with all they wanted. After President Roosevelt had signed the code on May 29, making it effective June 18, National Bakers' Council refused to acknowledge the provisions and to act as code authority. It took the stand that it could not enforce some of the provisions because the industry didn't want them.

As the outcome, the industry got the effective date deferred to July 9, the clause prohibiting the use of premiums restored, the date for reporting on the effect of wages and hours deferred to Nov. 15 and prices made effective immediately upon filing instead of after a five-day waiting period. The bakers' code is the only major one prohibiting the use of premiums.

Flour millers, who previously refused to accept a code favored by the administration because the stop-loss provision was not strong enough, went under a code June 13, the stop-loss provision of which was suspended by executive order and cannot be used until the Secretary of Agriculture declares that an emergency exists. Also stayed were those sections of the code prohibiting premiums and advertising allowances, the former being held up until a general N.R.A. policy covering it has been adopted and the latter being stayed 20 days.

Effective June 11, the canning code makes no mention of brokerage, a victory for the industry in that N.R.A. since April has insisted on a clause preventing payment of brokerage to anyone but a recognized broker. Not so well received by the industry, however, were two conditions ordered complied with by the President. One of these requires that within 90 days an industry committee recommend to N.R.A. new standards of quality and new labeling requirements. The other calls for a report, not later than Dec. 1, on the operation of the labor provisions of the code so that these may be improved.

The code covering the preserve, maraschino cherry and glacé fruit industries, effective June 18, directs the code authority to submit within 60 days minimum standards of quality and conditions of fruit used in preparing them, thereby conforming with the canners' code.

Candy Price Clause Stayed

Candy manufacturers started operation under a code June 25. In approving the confectioners' code, the President stayed indefinitely the waiting period in the open-price section and the clause prohibiting the use of premiums. He also stayed, for ten days, the section forbidding the sale of "break-and-take" goods. Among the 20 fair-trade-practice rules in the code, there is one stating that no member of the industry may repack candy for any buyer.

The code for the cocoa and chocolate manufacturing industry became effective June 18, with the clause prohibiting premiums suspended, as in all the other codes except that approved for the baking industry.

Bottlers Must Report on Labor

Also effective June 18, the code for the bottled-soft-drink industry was approved under the condition that the code authority report within six months on the functioning of the code's labor provisions. In the fair-practice provisions of the code it is stipulated that saccharin not be used in soft drinks except those labeled and sold for dietetic purposes and that a deposit be made on loans of cases, bottles, siphons, cartons and other containers. Bottlers are forbidden to give away, lend or rent coolers, ice boxes or other equipment, except bottle openers, display racks and advertising material.

Another code to go into operation June 18 is that for the ice-cream-cone industry. In this case, too, the code authority must make recommendations within six months on consumer grades and quality standards.

WHERE CODES STAND

APPROVED

Atlantic Mackerel	May 3	NRA
Baking (amended code accepted June 18)	May 29	NRA
Beet Sugar (Labor Provisions)	Oct. 27	NRA
Blue Crab	May 5	NRA
Bottled Soft Drink	June 7	NRA
Brewing	Mar. 22	NRA
California Sardine Processing	Apr. 24	NRA
Candy Manufacturing	June 11	NRA
Canned Salmon	May 16	NRA
Canning	May 29	NRA
Chewing Gum	Jan. 30	NRA
Cocoa and Chocolate	June 16	NRA
Coffee	Feb. 6	NRA
Fishing (Master Code)	Feb. 26	NRA
Fresh Oyster	Mar. 10	NRA
Grain Exchanges	Mar. 20	AAA, NRA
Ice Cream Cone	June 4	NRA
Imported Date Packing	Nov. 11	NRA
Macaroni	Jan. 29	NRA
Malt Products	June 22	NRA
Maraschino Cherry	June 8	NRA
Mayonnaise	Mar. 21	NRA
New York Live Poultry	Apr. 13	NRA, AAA
Peanut Butter	Apr. 4	NRA
Preserved and Glace-Fruit	June 8	NRA
Raw Peanut Milling	Jan. 12	NRA
Retail Food & Grocery Trade (Labor Provisions)	Oct. 21 Nov. 15	NRA NRA
Southern Rice Milling	Nov. 21	AAA
Spice Grinding	May 11	NRA
Tapioca Dry Products	Mar. 12	NRA
Wheat-Flour Milling	June 9	NRA
Wholesale Confectioners	June 6	NRA
Wholesale Food & Grocery (Labor Provisions)	Jan. 4 Nov. 15	NRA NRA
Wholesale Lobster	Apr. 13	NRA

HEARINGS SCHEDULED

Candy Manufacturing	July 10	NRA

Explains Code Assessments

With many food codes now in operation, manufacturers whose activities fall under several different codes have been worried about how many code authorities they will have to support. Welcome, though somewhat confusing, news on this came from N.R.A. last month with the announcement that "no employer shall be liable for assessment by more than one code authority." This left it up to N.R.A. to name the code authority to get the funds, and there were reverberations which brought forth a second announcement. This was an order that, "pending determination by N.R.A. with respect to specific codes upon cause shown by a code authority," industry members were "exempted from any obligation to contribute to the expense of any code authority other than that for the code which embraces their principal line of business."

Select Code Authorities

With their codes finally approved, many of the food industries are selecting code authorities to administer the fair-trade-practice provisions. The following have been named recently:

CANNING

Francis A. Harding, Wm. Underwood Co., Watertown, Mass., chairman; Ralph O. Dulany, John H. Dulany & Son, Fruitland, Md., vice-chairman; Fred A. Stare, Columbus Foods Corp., Columbus, Wis., vice-chairman; Robert C. Paulus, Paulus Bros. Packing Co., Salem, Ore., secretary; Elmer E. Chase, Richmond Chase Co., San Jose, Calif.; Fred B. Childs, Libby, McNeill & Libby, Chicago, Ill.; William Clapper, Grimes Canning Corp., Des Moines, Iowa; S. E. Comstock, Snider Packing Corp., Rochester, N. Y.; Alfred W. Eames, California Packing Corp., San Francisco, Calif.; Frank Gerber, Fremont Canning Co., Fremont, Mich.; Porter S. Lucas, Roy Nelson Canning Co., Crane, Mo.; H. E. MacConaughey, Hawaiian Pineapple Co., Ltd., San Francisco, Calif.; K. K. Mayer, Kuner Empson Co., Brighton, Colo.; Julian McPhillips, Dorgan-McPhillips Packing Co., Mobile, Ala.; W. A. Miskimen, Illinois Canning Co., Hoopeston, Ill.

FRANCIS A. HARDING
Heads Canning Code Authority

CONFECTIONERY

Election District 1, John M. Gleason, Boston; District 2, Walter W. Reid, Jr., Newark; District 3, John Voneiff, Baltimore; District 4, Ferdinand A. Bunte, Chicago; District 5, C. H. Woodward, Council Bluffs, Iowa; District 6, A. C. Carrington, Alameda, Calif.; District 7, W. E. Brock, Chattanooga; Class B, Max Sobel, Chicago; Class C, J. W. Brooks, Grand Rapids, Mich.

BOTTLED SOFT DRINKS

Chairman, Charles V. Rainwater, Atlanta, Ga.; vice-chairman, Wm. B. Hatfield, Brooklyn, N. Y.; James Vernor, Jr., Detroit, Mich.; J. B. O'Hara, Dallas, Texas, Frank P. Carr, Philadelphia, Pa., and William H. Willis, Washington, D. C.

SALMON PACKING

Ten of the eleven membersc are: WESTERN ALASKA: William Timson, Alaska Packers' Association; H. B. Friele, Nakat Packing Corp. CENTRAL ALASKA: A. M. Shiels, Pacific American Fishery; A. W. Wittig, Shepard Point Packing Co. SOUTHEASTERN ALASKA: D. W. Branch, Libby, McNeill & Libby; A. P. Wolf, Hood Bay Canning Co. PUGET SOUND: R. A. Welsh, Jr., Bellingham Canning Co.; C. J. Sebastian, Sebastian-Stuart Fish Co. COLUMBIA RIVER: W. L. Thompson, Columbia River Packers' Association, and A. L. Gille, Chinook Packing Co. The eleventh member of the Code Authority will be chosen by the members listed above.

PEANUT BUTTER

Owen Earhart, J. W. Beardsley's Sons, Newark, N. J., chairman; W. A. Barnes, Wheeler Barnes Co., Minneapolis, Minn.; Clarence J. Cook, Cream Dove Manufacturing Co., Binghamton, N. Y.; H. J. King, King-Fuller Co., Chicago, Ill.; W. A. Richards, Tom Huston Peanut Co., Columbus, Ga.; J. L. Rosefield, Rosefield Packing Co., Alameda, Calif.; A. E. Wehmeyer, Mavry-Cole Co., Louisville, Ky.

Food Bills of Major Importance Unenacted as Congress Quits

Summation of legislative action taken by the now dead seventy-third Congress does not reveal many direct hits scored against food industries. Major blows avoided by adjournment were the Copeland "pure food" bill and alleged "clarifying" amendments to the A.A.A. law that would have tightened the Secretary of Agriculture's dictatorship upon crop production and given him a powerful hold on food processors.

Another strong runner left on base was Senator Wheeler's joint resolution providing $250,000 for the Federal Trade Commission for investigation of incomes, investments, costs, profits and rates of returns of manufacturers and processors of principal farm commodities. Passed by the Senate toward the close of the session, this measure never left the Speaker's table in the House. However, the Trade Commission was voted $30,000 in House Concurrent Resolution 32 to investigate alleged monopolistic practices in distribution or sale of milk and dairy products.

President Roosevelt's request that the 3c. per pound tax levied on coconut oil from the Philippines in the 1934 Revenue Act be eliminated also failed. H.R. 9790, introduced to provide this, did not get to first base. The Henney bill, H.R. 3829, providing for drastic limitations upon imports of milk and dairy products, also failed to pass.

Sea Foods Bill Passes

The Congress passed the Stephens bill amending the 1906 food and drug law to allow sea-food packers to request inspection of their plants, equipment, methods, materials, containers and labels. Sea food found conforming to the requirements of the act may be so marked. A fee is to be charged for the inspection service. Penalties are provided for improper use or counterfeiting of identification devices authorized under the act.

All of the unenacted legislation is not dead, however, for the administration backs some of it, notably the Copeland bill, with enough resolve to bring it up in the next Congress.

Future Action Uncertain On Canners' Pacts

With the canners' major marketing agreements definitely abandoned for this year, the A.A.A. has not decided upon the course it will pursue next season. Corn and pea canners voted for pack allocation in this year's marketing agreements, but could not work out a plan favorable to the trade that the A.A.A. would approve.

Whether the trade will move for allocation of pack next year also remains in doubt. The opinion is expressed that the outcome of this year's pack and the prices received for it will guide the stand of canners on the question. At the same time it is pointed out that certain other trends in policy at the A.A.A. indicate that it is not improbable that the administration will ask for allocation itself.

Meanwhile a marketing agreement and license covering California raisins has been signed, and agreements for California cling peaches, dried prunes and bartlett pears, as well as for Northwest bartlett pears, are expected to be in effect by early July.

NRA Drops Price Fixing

After months of experiments in defiance of the normal functioning of supply and demand, N.R.A. early in June definitely turned its back on price fixing. According to the new price policy established by General Johnson, fixing even of minimum prices will be banned except in emergencies, where it is necessary to halt destructive price cutting. The new policy also permits open price provisions where desired by an industry, provided prices are posted.

An important feature of the ruling is that machinery has been set up to prevent cut-throat price competition between emergency periods. Any individual may complain of destructive prices to the code authority, which, if unable to handle the matter, will refer

it to the N.R.A. research and planning division.

The new price ruling, however, does not affect codes now approved, its main purpose being to obtain some uniformity in future codes. But it is the hope of N.R.A. that industries now under approved codes will change their pricing provisions.

Processing Tax Provisions Altered for Pork, Large Bags

Two changes in processing taxes have been made which affect pork packers and food manufacturers using large cotton, jute and paper bags. The processing tax provisions on hogs was redesigned to compel packers to pay the tax and prevent the levy from falling upon the farmers. The change alters the definition from "preparation for market" to "processing for distribution or use."

The other processing tax revision abates the levy on large-size cotton bags, terminates the compensating taxes on jute fabric and paper used in large bags and lowers the rate on jute fabric going into small bags from 2.9 to 2.1c. per pound.

Large bags, as defined in Secretary Wallace's order, means those having a cut area greater than 950 sq.in.

Packers Get Longer Week For Relief Processing

Mid-Western meat packers were so busy in June with the processing of relief livestock that they had to ask the N.R.A. for an extension of working hours. They received from Federal Surplus Relief Corp. contracts to handle 228,000 head of cattle and about 195,000 calves, this being converted into canned roast beef and veal sides. Realizing the difficulty of obtaining and training additional employees, General Johnson ordered that during the period of drought slaughter the employees needed for processing the beef might work 53 hours per week, though not more than 10 hours a day. Dating from June 13, the order is effective for four weeks.

Relief buying of hogs also was strengthened, being extended from June 5 to June 15. This was done to lend further support to the hog market during the heavy receipts resulting from the drought. A maximum of 15,000 head of hogs were purchased daily for relief distribution.

NRA Won't Ban Premiums

"N.R.A.'s position on the controversial question of premiums in the food and grocery trade has been explained. In view of the extent of the industry, the widespread use of premiums and the fact that premiums at times lend a desirable flexibility to rigid prices, there should not be a general prohibition against their use," General Johnson ruled. "On the other hand, certain uses of premiums may lead to increased cost of selling, deception of buyers and other abuses which justify a careful regulation of their employment."

No Change in Wheat Tax

There will be no change in the processing tax of 30c. a bushel on wheat for the 1934-35 crop, any increase having been made unnecessary by the drought's crop-reduction accomplishments. This announcement came from Clem Cochrane, of the wheat division of A.A.A.

CONVENTIONS

JULY

9-14—American Institute of Cooperation, annual, University of Wisconsin, Madison, Wis.

10-12—National Confectionery Salesmen's Association of America, annual, New York, N. Y. Henry H. Michaels, 282 Northern Ave., New York, secretary.

11—Mid-West Shippers' Advisory Board, quarterly, Milwaukee, Wis. A. W. Wilkins, 59 East Van Buren St., Chicago, secretary.

AUGUST

6-8—Bakers' Association of the Carolinas, annual, Battery Park Hotel, Asheville, N. C. E. B. Graeber, 1013 Commercial Bank Building, Charlotte, N. C., secretary.

12-16—National Food Distributors' Association, annual, William Penn Hotel, Pittsburgh, Pa. E. J. Martin, 1104 Franklin St., Chicago, secretary.

23—American Cranberry Growers' Association, annual, Pemberton, N. J. Charles S. Beckwith, Pemberton, secretary.

27—Sept. 1—National Association of Power Engineers, annual, Curtis Hotel, Minneapolis, Minn. Fred W. Raven, 1140 Lake St., Oak Park, Ill., secretary.

Sugar Industry Stabilized By Production Quotas

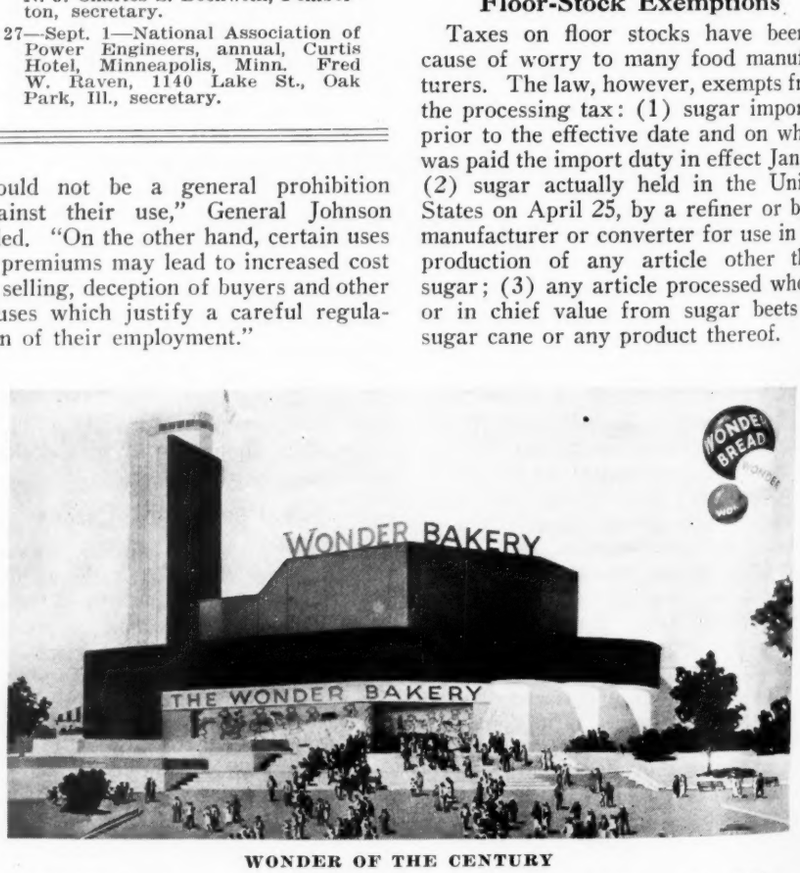
With announcement of the processing tax, ½c. a pound, on sugar, and the establishment of insular and continental quotas, the sugar industry of the United States now knows where it stands. The situation is unique, for there is a balance between supply and demand which should stabilize prices and keep the industry on even keel. Surpluses and destructive price cutting are expected to be a thing of the past.

Based on an estimated consumption of 6,476,000 short tons for the calendar year, exclusive of syrup and molasses, the total amount of beet sugar to be marketed in the United States has been fixed at 1,556,166 short tons, raw value, or 29,087,200 bags (100 lb.) This quota is divided between Eastern and Western producing areas, 84.79 per cent, or 24,663,502 bags, being allotted to the West and 15.21 per cent, or 4,423,698 bags, to the East.

The quotas fixed for areas outside continental United States, expressed in short tons, are: Hawaii, 917,000; Puerto Rico, 803,000; Philippines, 1,015,000; Cuba, 1,902,000; and Virgin Islands, 5,000. The Philippines already have reached their quota, and an excess of about 100,000 tons is en route.

Floor-Stock Exemptions

Taxes on floor stocks have been a cause of worry to many food manufacturers. The law, however, exempts from the processing tax: (1) sugar imported prior to the effective date and on which was paid the import duty in effect Jan. 1; (2) sugar actually held in the United States on April 25, by a refiner or by a manufacturer or converter for use in the production of any article other than sugar; (3) any article processed wholly or in chief value from sugar beets or sugar cane or any product thereof.



WONDER OF THE CENTURY

Wonder Bread stands out as one of the important exhibits at the 1934 Century of Progress. The Continental Baking Co. show occupies the former Dairy Building and is quite extensive. The company operates dough mixers, traveling ovens, slicers, wrapping machines and other equipment as a demonstration to fair-goers, and Wonder is the one bread baked at the fair.

Striking Workers Trouble Bakers and Packers

Bakers and meat packers in many parts of the country were troubled by labor difficulties during the past month. In the case of Gordon Baking Co., Detroit, the Labor Board of N.R.A. made an important decision, ruling, in regard to drivers, that the company was hostile to unionism and that "only reinstatement of a substantial number of employees will dispel suspicion of discrimination. . . " The board also directed reinstatement of a baker discharged because of union activity. Another bakery, Omar Baking Co., Columbus, Ohio, was forced to recognize union rights to settle a fourteen-day strike. In St. Louis, wholesale and retail bakeries entered into an agreement with the Bakery and Confectionery Workers' International Union of America under which the hours were cut from 48 to 40.

A two-week strike of packing-plant employees in St. Louis came to a close with an agreement engineered by the Regional Labor Board. The agreement provides for no discrimination against union members, at least 32 hours of employment weekly and utilization of the seniority principle in hiring and laying off workers. Several packing plants in the Greater New York area were affected by strikes beginning early in June and continuing through the month. Amalgamated Meat Cutters' and Butcher Worker's Union supported the strike, asking a 20 per cent increase in wages and improvement of working conditions. The number of workers involved was variously estimated at between 1,000 and 3,000. Armour & Co., Wilson & Co., Swift & Co., and Cudahy plants were among those affected.

In two cities, Oklahoma City and Birmingham, packing-plant strikers reached an agreement and returned to work. Union recognition was the point of controversy.

Confectioners Analyze New Order At Spirited Annual Meeting

Signing of the candy manufacturers' code by President Roosevelt on Monday afternoon, June 11, gave the fifty-first annual convention of the National Confectioners' Association, New York City, June 11-15, a stimulus which made it one of the most spirited in the history of the industry.

As if anticipating such action by the government, the programs of the general sessions were scheduled to deal largely with the code, its administration, and its enforcement. President George H. Williamson dwelt on the new order in industry in which labor has been made a partner with capital and management. He made a plea to the confectionery industry to accept gracefully and intelligently the new state of affairs, including the code of fair competition, and to concentrate its efforts on helping to direct the new economic order to the right instead of allowing it to drift farther and farther to the left.

Assistant Deputy Administrator P. J. Taft discussed the code article by article. George F. Brewer, Ernst & Ernst, Chicago, spoke on "Practical Application of 'Selling Below Cost' Rules of the Code"; R. H. Dick, Barrington Associates, New York, on "Marketing at a Profit Under the Code," and Charles Reitell, Stevenson, Jordan & Harrison, New York, on "Changing Management Problems Under the Code."

In these talks Mr. Brewer stated that "Selling below cost has become the accepted test of what constitutes destructive price cutting. . . . An important cause of destructive price cutting is a lack of knowledge on the part of both the manufacturer and the merchandiser or jobber as to his own costs." Mr. Dick held that "The government is not going to run one's business for him." Mr. Reitell was convinced there had been too much thinking on codes and not enough on management and that

GEORGE H. WILLIAMSON
Re-elected President of Candy Group

manufacturers have been depending on codes to solve their problems just as if they were still believing in Santa Claus. Clarence Francis, in his presentation of "Adjustment of Sales Policies and Methods to Code Conditions," put up an argument for a single code to cover the whole of food merchandising.

Production forum sessions under the chairmanship of Carl Graeser, National Candy Co., St. Louis, included discussions by Whitman Rice, National Sugar Refining Co., on the uses of cane sugar in candy; by George E. Corson, Clinton Corn Syrup Refining Co., on starches and their various uses; by F. E. Robinson, United Chemical & Organic Products Co., on gelatin and its use in marshmallow work; by James A. King, Nulomoline Co., on rolled cream centers; by Evan L. Rhoades, California Fruit Growers' Exchange, on pectin jellies; by Dale Steely, former general superintendent, Wm. F. Schrafft & Sons Corp., on plant efficiency; by F. H. Drexler, Reynolds Metals Co., on new developments in metal-foil packaging; and by L. B. Steele, DuPont Cellophane Co., Inc., on the virtues of transparent packaging.

Displays of packaging supplies and equipment and of ingredients materials dominated the exposition, the eleventh to be held in connection with N.C.A. conventions. There were a total of 59 exhibitors, as compared with 44 last year.

With a total of nearly 2,000, registered attendance was considerably in excess of expectations; more than 65 per cent greater than at Chicago last year. The high spot of the convention was the banquet of Wednesday evening with a record attendance of 1,150 people.

The confectioners reelected George H. Williamson, Williamson Candy Co., Chicago, to the presidency. The vice-presidents for the coming year are J. M. Gleason, W. F. Schrafft & Sons Corp., Boston, and Wm. E. Brock, Brock Candy Co., Chattanooga, Tenn.

Six More Milk Licenses Go Into Effect

New or amended milk licenses went into effect in six marketing areas on June 1, in general increasing the prices distributors must pay producers in those milksheds. Amended licenses were issued for the Chicago, Omaha, Council Bluffs, and Boston territories. New licenses were granted for Los Angeles, Louisville and the "Quad Cities" (Bettendorf and Davenport, Iowa; Moline, East Moline and Rock Island, Ill.).

Tax on Sugar Syrup Cut

Domestic cane-sugar interests were victorious in their fight with the A.A.A. to change the processing tax on edible molasses and sugar syrups from total sugar content of the products to the recoverable sugar content. A ruling has been issued by the adjustment administration making the base rate of the tax on syrup and molasses one-fourth of the base rate on sugar or $\frac{1}{8}$c. on each pound of sugar content. A figure of $11\frac{1}{2}$ lb. has been adopted for taxing purposes as the weight of a gallon of syrup with a sugar content of 65 per cent. Individual producers of sugar syrup and molasses are allowed the right to prove their product has a different weight and sugar content if they so desire.

Cereal Chemist Group Meets in Toronto

More Than 50 Papers Presented; Mary M. Brooke Elected

Cereal chemists and wives, 188 of them, from as far west as Calgary, Alberta, and as far south as Louisville, Ky., migrated to Toronto, Ontario, for the twentieth annual meeting of American Association of Cereal Chemists, held at the Royal York Hotel, June 4-7; the first meeting to be held in Canada.

MARY M. BROOKE

On the opening day a charter was presented to the Toronto group, headed by Albert E. Cliffe, Standard Brands, Ltd., designating it as the eleventh section of the organization.

In addition to reports from fifteen standing committees, addresses by Dr. E. F. Burton, University of Toronto, on "The Peculiar Action of Thin Films of Water," and by Dr. W. Lash Miller, University of Toronto, on "A Fourth Constituent of Wildier's Bios," and joint meetings with the Canadian Chemical Association, Association of Operative Millers, and the Toronto Bakery Engineers, more than 50 papers were presented at morning and afternoon sessions of the meeting. Diastatic activity and gassing power of commercial flours came in for considerable attention. Many papers deserved a more deliberate reading and a wider discussion than the crowded program would permit.

In the final session action was taken authorizing the publication of the history of the A.A.C.C., of a decennial index to *Cereal Chemistry* and of a new *Book of Methods.*

As another step in the direction of extending association activities into all branches of the food industry in which cereals are used, a standing committee was appointed by President Mary M. Brooke on Standardization of Methods of Brewing and Malting Control, with Dr. D. A. Coleman, Washington, D. C., chairman.

An educational exhibit of equipment and laboratory supplies was held in connection with the meeting. Among the exhibits shown for the first time was the Wallace & Tiernan, Inc. (Newark, N. J.) machine for determining and comparing flour color values, and the C. J. Tagliabue Manufacturing Co. (Brooklyn, N. Y.) power-driven unit for electrical determination of the moisture content of cereals.

In the election of officers, the chemists named as president Mrs. Mary M. Brooke, Purity Bakeries Corp., Chicago. She succeeds R. E. Sherwood. Other officers are Washington Platt, Borden Research Laboratories, Syracuse, N. Y., vice-president, and M. D. Mize, Omaha Grain Exchange, Omaha, Neb., secretary-treasurer. D. A. Coleman was reelected editor-in-chief of *Cereal Chemistry* and C. C. Fifield, managing editor. Both are of the Department of Agriculture.

HORS D'OEUVRES

HERE'S AN IDEA that will cut labor costs for coconut packers. Instead of husking coconuts, the natives in Chile pile them in cattle corrals and let the bovines eat off the husks.

•

FISHERMEN in New Orleans have perfected a handcuff of flexible wire which they slip over the claws of particularly vicious lobsters to protect the anatomy of the other crustacea. Which probably makes the he-man lobster feel much like a crawfish.

•

BANANA JULEP, samples of which Fruit Dispatch Co. recently gave 6,000 nurses in convention, represents the latest attempt to make the banana an all-purpose fruit. It's getting so a man can't even take a drink without getting nourishment.

•

SALMON SKINS soon may adorn the personal effects of lovely ladies. A scientist at Prince Rupert, B. C., is working on a process for tanning the skins so that the scales won't fall off.

•

WOMAN'S FEAR of fat is demoralizing the early strawberry crops in the South. It seems the fruit isn't popular without cream, and cream doesn't cut much of a figure. As a result, strawberry growers are trying to develop a juice that will compete with the citrous variety. They already have a wine, popular locally, for which they are considering wide distribution.

•

DAIRIES which can't pay dividends in this country should go South and grow up with Mexico. Senor Miguel Muzquiz, of Mexico City, who operates one of the truly up-to-date creameries, is troubled more by his inability to care for his customers than by the problem of maintaining his trade.

Operative Millers Hold Annual Convention

Visit Canadian Flour Mills; Elect Leonard Carmichael

With a record of 122 new members to its credit for the past year, the Association of Operative Millers met in its thirty-ninth annual convention at Toronto, June 4-8. Approximately 350 attended.

As sessions were held only in the forenoons, the visiting head millers availed themselves of the opportunity to visit near-by Canadian flour mills as well as attend a joint session with the American Association of Cereal Chemists.

Although the greater part of the sessions were given over to papers on such practical milling subjects as standardization of milling equipment, modern aerodynamics in flour mills, purification of winter wheat middlings, corn milling, problems of flour blending, classification of break separations; breaking, bolting and purifying, and care of leather belting, there was an injection of management problems.

LEONARD CARMICHAEL

These took the form of reading and discussing the milling industry code as formulated by the Millers' National Federation and a paper on the relation between the superintendent and his second millers.

The outstanding feature of the sessions of this group were the open forums, which were under the guidance of a different leader each session. In these forums were discussed in an extemporaneous manner such subjects as purifying and bolting, safety and sanitation, cleaning and conditioning, grinding and reduction, and problems of the small mills.

Leonard Carmichael, National Milling Co., Toledo, was elected president of the association; Jess Carter, Quaker Oats Co., St. Joseph, Mo., was chosen vice-president; Herman H. Trapp, Russell-Miller Milling Co., Buffalo, treasurer. C. W. Partridge, Kansas City, Mo., continues as secretary of the operative millers' organization.

Macaroni Men Take Up Troubles at Chicago

To Crack Down on Code Violators; Louis S. Vagnino President

Price-cutting practices proved of much concern to the 125 members of National Macaroni Manufacturers' Association who convened in Chicago, June 12-14. A closed meeting was held at which all members of the industry whose price lists pointed to sales below cost were requested to appear and explain their pricing activities. From this hearing the code authority obtained information which will be of value to it in fixing a proper minimum price, this to be added to the code. The association's president and chairman of the code authority, Glen G. Hoskins, made it plain that code violators would be cracked down upon heavily during the coming year and indicated that lines would be drawn more closely by adding new clauses to the code.

Standardization of labels, reduction in number of package sizes, distinguishing definitions for egg and eggless noodles, and reduction in number of flours employed in macaroni products represent other important industry problems taken up at Chicago. B. R. Jacobs, deputy code executive, discussed code labeling and standard provisions, and suggested definite type sizes for labels. The association then passed a resolution that this be put into effect.

The standards committee reported on its package survey, stating that there exist entirely too many sizes of both bulk and package goods, resulting in a loss in economy, duplications of stock, and confusion in competition. Elimination of odd sizes is indispensable, the committee found.

In the noodle makers' conference much discussion centered on the problem of when a noodle is not a noodle. It was the consensus that much of the trouble would disappear if egg and eggless noodles had different names, if they were distinctly labeled and if packages were standardized.

A promising development came at the close of the meeting when Mr. Hoskins revealed that the millers had tentatively agreed to make only two grades of durum flour—a standard grade and fancy grade. Such a practice would do much to eliminate inferior macaroni products.

Before bringing their convention to a close the macaroni men put on the books several resolutions. Especially important among these was one allowing the manufacturer making less than 25,000 lb. a month a 5 per cent reduction in conversion factors. This probably will be put into the code.

Heading up the activities of the association for the next year will be Louis

LOUIS S. VAGNINO

S. Vagnino, American Beauty Macaroni Co., St. Louis, who succeeds Mr. Hoskins as president. Joseph Freschi, Mound City Macaroni Co., St. Louis, becomes vice-president, while M. J. Donna remains secretary-treasurer.

Revises Standards for Peas, Tomatoes and Cherries

Important changes in the standards for canned peas, canned tomatoes and canned cherries become effective Aug. 21, having been approved by Acting Secretary of Agriculture Rexford G. Tugwell. The revised standards provide that peas shall not be considered immature if the water insoluble solids in the drained peas exceed 22 per cent, or if 25 per cent or more of the peas by count are swollen to such an extent as to rupture the skins sufficiently to separate the broken edges by $\frac{1}{16}$ in. or more. Another revision pertaining to canned peas defines "added liquid."

Under these new standards, when canned cherries fail to meet the substandard quality requirements in that they consist of pitted, whole cherries, otherwise meeting the standard, except that they may not meet the requirements for normal and uniform size, they shall bear the special statement "Pitted Cherries."

In regard to canned tomatoes, the revisions redefine the term "normally colored."

Packers' Hearing Reopened

Opened in Jackson, Miss., May 17, the Department of Agriculture's hearing into alleged price fixing and violation of the stockyards act of 1921 by twelve packing companies was reopened at Birmingham, Ala., last month. As the fight between the government and the packers progressed amid contradictory testimony, C. E. Miles, chief of the counsel for the government, threatened to add to the already voluminous records of the case invoices of 25,000 customers of the packers. Among important witnesses called were Max Goldberg, Alabama Packing Co., and Lee B. Weil, Evansville Packing Co.

Only ⅛c. Profit in Milk

Those in power in Washington have said much during the past few months about the difference in the price of milk at the farm and delivered to the doorstep. And that a true picture of the profit and expense involved in handling milk from the farmer to the consumer might be presented, Borden Co. has published in its organ, *The Borden Eagle*, a breakdown of costs and profit, such as was done by FOOD INDUSTRIES in its October, 1930, issue. The Borden figures show a profit of ⅛c. a quart. They are as follows:

Price per quart (average)	0.09089
Profits	0.00127
Officers	0.00020
Advertising	0.00063
Taxes	0.00107
Materials and other expenses (buildings, equipment)	0.01556
Transportation to city branches	0.00855
Labor (including delivery)	0.02371
Farmer	0.03990

CONCENTRATES

Proposals that the Federal Emergency Relief Administration rent or lease canneries and operate them to pack food for relief purposes have been abandoned. . . . So far, the Public Service patent covering the removal of spray residues from fruits, as described in FOOD INDUSTRIES, May, page 231, has not been issued, but should be forthcoming soon.

An international committee of olive-oil chemists has been organized to develop standard methods for the analysis of olive oil and its products. . . . Yellow transparent cellulose has been barred by agreement as a wrapper for macaroni products, since it gives the impression of too high an egg content.

Grand Union Co., Chicago, is trying out a plan of dating all packaged merchandise in its retail stores. . . . California deciduous fruit growers will save about $2,500,000 this year through reduction in freight rates recently granted by Eastern railroads, the rate being cut from $1.73 to $1.55. . . . The bill establishing a milk publicity bureau in New York State's Department of Agriculture and Markets recently was approved by Governor Lehman. . . . The fish laws in New York State have been changed to permit the sale of frozen oysters at any time of the year, provided the oysters are frozen between Sept. 1 and May 14.

A Danish manufacturer has introduced a paper milk "bottle" which has a rectangular shape like that of the Pure-Pak carton, made in Toledo, and is closed with a metal clip, as is the American Sealcone Corp. container. . . . The "little A.A.A." in the State of Washington still maintains its policies after weeks of bitter strife; it has fixed retail prices on milk, butter, bread and ice cream.

MEN . . . JOBS . . . AND COMPANIES

Industry

AMERICAN COFFEE CO., INC., New Orleans, has acquired the brands and blends of New Orleans Coffee Co., Inc., for more than 40 years roasters and packers of Morning Joy, French Market, Pointer and other blends.

ANHEUSER-BUSCH, INC., St. Louis, is adding new equipment and making repairs and improvements to its plant, costing about $1,050,000. Plans call for a program of similar proportions in 1935.

BALBOA BREWING CO., Los Angeles, last month completed its new plant there, which cost about $1,000,000 and brought total capacity up to more than 1,500,000 gal. monthly.

BEECH-NUT PACKING CO. will add to its Rochester (N. Y.) plant at a cost of $250,000.

DAVID BUTTRICK CO., Arlington, Mass., is planning to build a milk plant costing $75,000, to alter its creamery plant at a cost of about $20,000, and to build a milk-receiving station at Montpelier, Vt., at a cost of about $15,000.

CENTRAL WISCONSIN CANNERIES, INC., and Minnesota Valley Canning Co. will build jointly a cannery at Dayton, Iowa, expected to be one of the largest in the country. Operations are to begin in early August.

CLARK DAIRY PRODUCTS CO., Murfreesboro, Tenn., will spend $40,000 in expanding and reequipping its plant.

FRED ECKART PACKING CO., INC., Fort Wayne, Ind., is in receivership, after being closed down by Kuhner Packing Co., Muncie, Ind., operator, on account of labor difficulties.

FREDONIA (N. Y.) WINE CO. has acquired the former Taylor plant, Portland, N. Y., and will prepare for pressing in the fall. Dry red and white wines will be produced.

HALLS (Tenn.) canning plant, Craddock Canning & Produce Co., destroyed by fire in May, will be rebuilt.

CHARLES LIVOTI CO., Roseville, Calif., is constructing a new building for olive-oil and wine manufacture, to occupy a city block and to have a storage capacity of 300,000 gal.

MOORE-LOWRY FLOUR MILLS CO., Kansas City, has acquired Sweetheart Flour Co., Coffeyville, and will make its headquarters there.

MOUNDRIDGE (Kan.) MILLING CO. will add a two-story building to its mill, for manufacturing breakfast foods.

NEW CITY PACKING & PROVISION CO., Chicago, plans to spend $75,000 in reequipping a building recently leased in that city.

STANDARD BRANDS, INC., is planning a four-story building at Peekskill, N. Y., for gelatin manufacture.

FRED L. STEVENS is president and LEE REEVES secretary-treasurer, Geneseo (Ill.) Canning Co., which has succeeded Midwest Foods, Inc.

STRUVE MERCANTILE CO., Abernathy, Texas, has installed a third 10,000-gal. cheese vat in its plant, bringing its capacity up to 30,000 lb. daily, with an average handling of more than 20,000 lb., all of which is sold to Swift & Co.

TENNESSEE VALLEY AUTHORITY has granted an operating fund of $10,000 to a cooperative cannery at Murphy, N. C.; tomatoes and beans will be packed this year.

TULSA PACKING CO., Sand Springs, Okla., will improve its plant at a cost of $16,000.

WEIL PACKING CO., Evansville, Ind., will add to its plant at the cost of $90,000.

WILSON PACKING CO. storage building, Albert Lea, Minn., was damaged last month by fire at a loss of $80,000.

PERSONNEL

R. T. BOHN continues in charge of the cereal testing and bakery service laboratory, Great Atlantic & Pacific Tea Co., moved last month from Detroit to Minneapolis, with Frank M. Tully, agent, as supervisor.

WILLIAM S. COX, former vice-president and general manager, Federal Sweets & Wafer Co., Inc., Brooklyn, is vice-president and technical adviser, Haug & Co., Inc., Brooklyn.

DANIEL W. CREEDEN, former general manager, Swift & Co. New England packing plants, has been elected vice-president in charge of all the firm's Eastern packing plants.

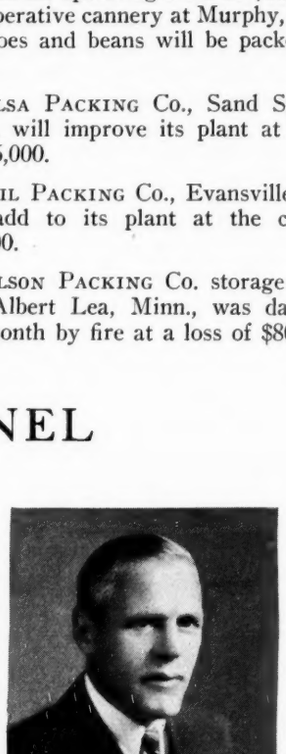
G. E. FINDLEY, Morten Milling Co., Dallas, has been elected chairman, Lone Star section, American Association of Cereal Chemists.

C. F. GREINER, president, Southern Shellfish Co., New Orleans, will continue in charge of shrimp and sauerkraut-packing operations under the Blue Plate label of Wesson Oil Co., which has acquired the former company.

JOSEPH E. GUINANE, with the General Seafoods Gloucester (Mass.) plant since 1926, has been appointed product manager of Birdseye meat, fish and poultry, Frosted Foods Sales Corp. DONALD BARR, former adviser to British Canners, Ltd., is product manager for Birdseye fruits and vegetables.

GEORGE R. HARRISON is manager, Cudahy Fall River (Mass.) branch, succeeding A. R. Wesson, transferred to Chicago.

NORMAN HENDRICKSON, sea-food-canning authority, will act as traveling adviser to canners, representing the shrimp section, National Canners' Association.



EDWIN T. GIBSON
Former president, Baker-Bennett-Day, Inc., General Foods subsidiary, he has been appointed president, Frosted Foods Sales Corp., New York.

LAMBERT D. JOHNSON, former vice-president and general manager, Mead Johnson & Co., Evansville, Ind., has succeeded his father, the late E. Mead Johnson, as chairman of the board.

STANLEY L. KEDZIERSKI, Bureau of Foreign and Domestic Commerce, and author of distribution cost studies in the confectionery industry, is acting administration member of the code authority for the chewing-gum industry.

E. N. KIRKPATRICK is manager, Louisiana State Rice Milling Co., Abbeville, succeeding E. G. Goldsmith, retiring after 25 years of service.

HERBERT B. LARNER, formerly at Chicago headquarters, American Research Products, Inc., is now divisional sales manager for that firm in New York, with headquarters at Washburn-Crosby

Co. offices, to promote the sale of Sun-A-Sured vitamin D concentrate.

RALPH J. LASCHE is assistant manager, Rath Packing Co., Houston, transferred from Waterloo, Iowa.

GEORGE W. LOFT, founder of Loft, Inc., has opened Loft Pure Food Market, New York, the first of a proposed chain of super-markets.

R. H. MACDONNELL, formerly in charge of the Quaker Maid Co. laboratory at factory No. 1, is now in charge of the new central laboratory in the Graybar Bldg., New York, where supervisory control of all Quaker Maid laboratories is centered. H. C. BROGE is in charge of the laboratory of factory No. 1 in the Gair Bldg., Brooklyn.

L. G. MCKEE, formerly with Fisherman's Packing Co., Everett, Wash., is now with Suryan Packing Co., Annacortes, Wash.

HARRY A. MITCHELL, professor of marketing, Tulane University, is administration member of the control committee for the Southern rice milling industry.

CHARLES H. NEWMAN, former general manager, Wichita Mill & Elevator Co., Wichita Falls, Kan., has been elected vice-president of that firm and of Kell Mill & Elevator Co., Vernon.

R. O. PIERCE, identified with the salmon-packing industry for nearly 15 years, is manager of the newly organized canned salmon department, William W. McBride Co., Seattle.

P. R. PITTS, former chemist, Red Band Co., Johnson City, Tenn., is in charge of the installation and management of a new control and research laboratory, Evans Milling Co., Indianapolis.

J. E. REEDY is plant superintendent, Pabstett Corp., Plymouth, Wis., subsidiary of Kraft-Phenix Cheese Corp.

R. T. RINEY, former general manager, Sterling Brewers, Inc., Evansville, Ind., has been made president.

J. RAYMOND SANBORN, formerly with the research department, International Paper Co., and previously in charge of the department of bacteriology, McGill University, is now engaged in bacteriological and related investigations, particularly in the food industries, for Arthur D. Little, Inc., chemists and engineers, Cambridge, Mass.

W. A. SAYLES is manager of the new Chicago office, Canada Dry Ginger Ale, Inc.

A. H. SPADER, Blue Moon Ice Cream Co., Bergenfield, N. J., is treasurer, Metropolitan Association of Ice Cream Manufacturers, succeeding A. L. Hackman.

LEO H. STEINHAUER, 7340 Keen Way, Seattle, has been appointed Washington and Oregon representative for "Astra-D" vitamin D concentrate, marketed by Lancaster, Inc., New York.

CLARENCE FRANCIS

Speaking before the National Confectioners' Association convention last month, the executive vice-president, General Foods Corp., stated, "Business today needs the stimulus of long-range confidence based on more emphasis on private initiative. It is obvious that business statistics are much better today than business psychology. . . ."

JACOB STOLP, cocoa and chocolate technician and consultant, formerly with Rockwood & Co., Brooklyn, and Park & Tilford, New York, is plant superintendent, Eatmor Chocolate Co., Pittsburgh.

WALTER THOMAS, for 39 years with Franklin Sugar Refining Co., Philadelphia, has opened a sugar and general merchandise brokerage business in that city.

JULIAN H. TOULOUSE, research director, service laboratory, American Bottlers of Carbonated Beverages, has been notified of his election as fellow of the American Public Health Association, in which he has been a member of the committee on foods for the past two years.

W. R. TUCKER, former executive with Icebound Products, Inc., quick-frozen food firm, has taken over a Tom Huston Georgia peach-freezing plant and is freezing peach pulp for use in making brandy.

R. W. VOHL, HARRY WILKINSON and JOHN BORGER have been named superintendents at Armour & Co. plants at New York, South St. Paul and Sioux City, Iowa, respectively.

C. M. WALTERS, for many years head of the vegetable and pickle and condiments division, Libby, McNeill & Libby, Chicago, has been appointed to the executive staff of E. G. McDougall, president. W. T. REYNOLDS, his former assistant, is manager of vegetable packing plants, and EARL PRICE is manager of pickle packing plants.

JAMES A. WHITE, former manager, Swift & Co. San Francisco plant, has been appointed general manager of all that firm's West Coast packing plants and branch houses.

DEATHS

JOHN M. BLAIR, vice-president and general manager, Meyer-Blair Milling Co., at Springfield, Mo., June 3. He was accidentally shot.

JOHN S. CAMERON, 86, for 46 years production manager, Iglehart Bros., Inc., Evansville, Ind., at Evansville, June 8.

JOHN E. ENZ, 53, president, Enzo-Jel Co., Milwaukee, at Milwaukee, June 12. He was killed when his automobile overturned.

FRANK H. GOOD, 57, superintendent, Armour & Co. plant, Fargo, N. D., May 27. Prior to his affiliation with Armour in 1925, he had been with Cudahy, Omaha and Swift packing companies.

ALONZO HUSBAND, 66, former secretary, Miller's National Federation, at Swedish Covenant Hospital, Chicago, June 12.

F. J. REYNOLDS, 53, vice-president, Armour & Co., at Glencoe, Ill., June 22. He shot himself as the result of ill health. He had been with his firm for 38 years and was in charge of the purchasing department at Chicago.

Associated Industries

R. H. BURSCH, formerly general manager, container division, Robert Gair Co., Inc., New York, is now vice-president in charge of production and sales in all operating divisions of the firm.

CONTINENTAL CAN CO., reported to be planning the establishment of Western headquarters at Denver, has purchased a plant there, and will spend $50,000 for equipment.

HOBART MANUFACTURING COMPANY, Troy, Ohio, has acquired the Dayton Scale Division of International Business Machines Corp., in exchange for a substantial minority interest by the latter firm.

INVENTORS' FOUNDATION, INC., 122 East 42d St., New York, N. Y., has been founded by Henry J. Gaisman, to guide the layman-inventor in procedure for protecting inventions.

F. B. LEHMANN has been elected president, J. M. Lehmann Co., Inc., New York, to succeed the late Emil Raue.

REYNOLDS METALS CO., New York, has acquired the General Electric bulb works property, Harrison, N. J.

VOGT INSTANT FREEZERS, INC., and VOGT PROCESSES, INC., have moved joint Eastern offices from 199 Main St., White Plains, N. Y., to 21 West Putnam Ave., Greenwich, Conn.

BUSINESS TRENDS

Prices at New Peak

Flour, dairy products, eggs, livestock and fresh beef and pork prices, reflecting the drought devastation during the last two weeks of May and first two weeks of June, showed considerable strength, sending general price averages up to new highs for the year. Cuban raw sugar made a four-year high about mid-June.

Business activity, while declining seasonally, has been steadier than usual during the late spring period. Although curtailment of operations was general, automobile and steel activity held up well, the latter even making a new yearly peak at 57.4 per cent of normal early in June.

The Business Week Index of business activity stood at 66.1 per cent of normal for the week ending June 16—1.0 per cent below May 12.

Wholesale prices reported by U. S. Department of Labor for the month ending June 16 were up 0.6 per cent to 74.6 from the figure of May 12, topping the level of March 10, the peak since April, 1931. Farm products rose 3.2, manufactured foods 0.9 per cent.

All commodities during the month ending June 23 rose 1.3 per cent to 76.7 in the New York **Journal of Commerce** weighted price index, the highest level since June 21, 193 Grain advanced 5.2; food, 2.8 per cent.

BASIS FOR THE CURVES

Retail food prices, factory employment, factory payrolls and wholesale prices are based on indexes of the Department of Labor. Cost-of-living index is that of the National Industrial Conference Board. Electrical power consumption figures are furnished by *Electrical World.*

U. S. Wheat Crop Forecast Drops 135,000,000 Bu.

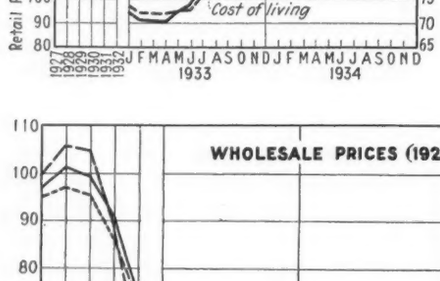
Disastrous drought conditions lasting more than four months were reflected in the June 1 forecast of the Crops Reporting Board, which included an estimate of 400,357,000 bu. of winter wheat, about 61,000,000 bu. less than the estimate of May 1. Although no official estimate was made for spring wheat, it was thought the crop might be about 100,000,000 bu., at least 75,000,000 bu. less than predicted May 1. Thus, the total wheat crop probably will be not more than 500,000,000 bu., 150,000,000 bu. below usual domestic needs and 300,000,000 bu. below the normal harvest. The possibility of an even smaller crop than last year, when 351,000,000 bu. was produced, is indicated by the condition of winter and spring wheat on June 1—55.3 and 41.3 per cent of normal, respectively, the lowest conditions on record for these crops.

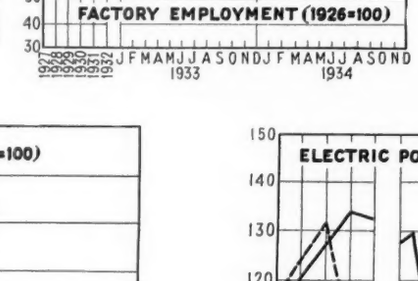
Offsetting somewhat the losses in harder-hit drought affected regions, wheat production in the Southwest has been estimated at 169,075,000 bu. for this year, about 26,000,000 bu. more than in 1933. Although the drought wiped out a million bushels of wheat a day in Kansas and reduced the Nebraska crop to about one-half, production increases in the other States balance the losses.

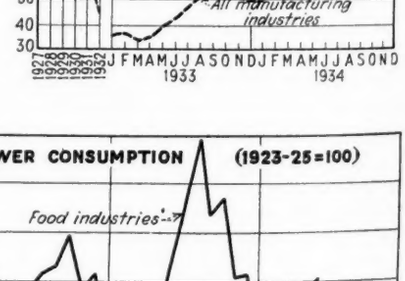
World wheat estimates forecast a reduction in output of about 100,000,000 bu. in the Danube basin, a possible reduction of 300,000,000 for all European countries, and a reduction of about 20,000,000 bu. in the Indian crop. Lowest conditions of Canadian field crops in the 26 years figures have been kept have been reported by the Dominion Bureau of Statistics.

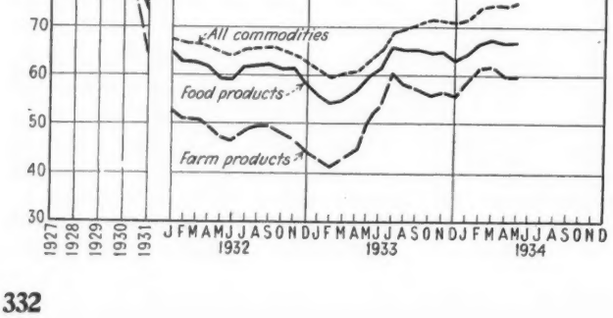
Salad Dressing Production Jumps 46.9 Per Cent

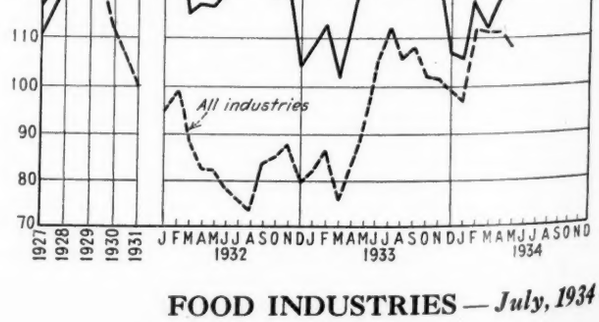
Salad-dressing production in 1933, for the first time since the mayonnaise and related products industry began, was greater than mayonnaise output, comparative figures of the total production of all items being 54.1 per cent for salad dressing and 34.3 for mayonnaise. Salad-dressing production in 1933 again showed a large gain over the previous year, 46.9 per cent, after having increased 52.5 per cent in 1932 over its volume of 1931. While 62 of the 70 reporting firms manufactured mayonnaise and only 44 packed salad dressing, the average production of mayonnaise per firm was 132,000 gal., while the average production of salad dressing per firm was 293,000 gal. Total production of all items in 1933 by 69 reporting firms was 23,748,768 gal., 8.3 per cent more than in 1932. Figures are those of the Bureau of Foreign and Domestic Commerce.


RETAIL FOOD PRICES, COST OF LIVING
Retail Food Prices (1913=100)
Cost of Living (1923=100)
Retail food prices
Cost of living
1927 1928 1929 1930 1931 1932 J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1933
1934


Food industries
All manufacturing industries
FACTORY EMPLOYMENT (1926=100)
1927 1928 1929 1930 1931 1932 J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1933
1934


FACTORY PAYROLLS (1926=100)
Food industries
All manufacturing industries
1927 1928 1929 1930 1931 1932 J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1933
1934


WHOLESALE PRICES (1926=100)
All commodities
Food products
Farm products
1927 1928 1929 1930 1931 J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1932
1933
1934


ELECTRIC POWER CONSUMPTION (1923-25=100)
Food industries
All industries
1927 1928 1929 1930 1931 J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1932
1933
1934

Trade Pacts to Benefit Food Manufacturers

Packing-house products, flour and many other food products are expected to benefit from reciprocal trade agreements likely to be drawn up during the next twelve months. The chief purpose of the trade agreements will be to increase agricultural exports and increase industrial goods imports. Thus, if agriculture is to benefit materially, processed agricultural products will of necessity be included in the pacts. Food industries are likely to realize benefits particularly from the administration policy of buying large quantities of silver in countries which would most probably use the gold paid for it to purchase American manufactured products.

Confectionery Sales Rise

Sales of all types of confectionery and competitive chocolate products by 386 manufacturers in 1933 were 1,204,146,346 lb., compared with 1,149,818,535 lb. in 1932, an increase of 4.7 per cent in total tonnage. Dollar volume, however, was off 1.8 per cent from $168,972,235 in 1932 to $166,190,663. Considering the 19.6 per cent drop in 1932, the small decrease in dollar sales in 1933 may be taken to denote the definite slowing up of the contraction in sales volume.

Buy Own Product Freely

Wine consumption in the United States, based on figures for consumption in California, could be as high as 200,000,000 gal. annually, stated Robert D. Rossi, secretary-treasurer, Italian Swiss Colony, at a recent conference at Del Monte. Considering that Californians are consuming 1.6 gal. per capita yearly, the State 800,000 gal. monthly or 9,600,000 gal. yearly, the nation could consume about twenty times as much, as California contains only 4.8 per cent of the population.

Cherry and Pear Stocks, Spinach Pack Reported

Pacific Coast carry-over of cherries and pears, as of June 1, amounted to 152,697 and 272,960 cases, respectively, of No. 2½ cans, indicating a movement from June 1, 1933, to June 1, this year, of 812,084 cases of cherries and 4,567,309 cases of pears. Carry-over of apricots and freestone peaches in California June 1 totaled 166,820 and 1,746 cases, respectively, of No. 2½ cans. Estimated carry-over of cling peaches totals 2,381,590 cases.

The California spinach pack this year totals 1,899,731 cases, including 229,825 cases in the "winter pack" of January and February. The pack since March 1, amounting to 1,669,906 cases, is about 82,000 cases larger than in 1933 and about 850,200 cases larger than in 1932.

"Residue" Crop Processed

Ripe tomatoes, the "residue" from the Rio Grande Valley's "fresh" crop, sold for $2,000,000, are being turned into canned tomatoes, catsup, tomato paste and other products in eight canneries of the region. With a 500-carload mark in mind, total production in the eight plants up to the middle of last month had reached 150 carloads, from which an income of $300,000 had been obtained. A surprising reason given for failure of the plants to operate at maximum capacity is shortage of labor.

INDICATORS

MEAT CONSUMPTION in the United States in 1933 was about 17,960,000,000 lb., amounting to 142.9 lb. per capita, compared to 140 lb. per capita for the period 1923-1932 and 131.1 lb. per capita for the period 1913-1922.

CANDY SALES in the first four months of this year were 28.2 per cent heavier than for the same period last year, according to the Bureau of Foreign and Domestic Commerce, while dollar volume rose to $67,464,064, showing an increase also of about 28 per cent.

CANE-SUGAR REFINERS delivered to the sugar trade in the week ending June 9 about 160,000 long tons, the largest weeks delivery in the records of the Sugar Institute.

JAPANESE CANNED FOOD EXPORTS for the first quarter of this year amounted to 24,929,959 lb., 48 per cent more than in the same period last year, canned fruit exports, totaling 9,136,956 lb., were 7,000,000 lb. heavier. The United Kingdom took 40 per cent of Japan's total exports, compared with 17 per cent last year; the United States, however, took only 12 per cent, compared with 38 per cent last year.

MILK AND CREAM CONSUMPTION per capita in cities and towns in 1933 was 38.8 gal., compared with 40 gal. in 1932 and 1931, 40.7 gal. in 1930, and 40.8 gal. in 1929.

COLD-STORAGE HOLDINGS of lard on June 1 were 182,576,000 lb., approximately 65 per cent larger than on the same date last year and 58 per cent more than the average for 1929-1933.

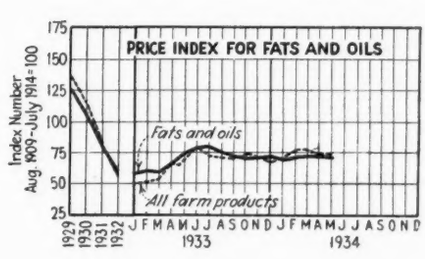
FLOUR PRODUCTION in May, totaling 4,993,003 bbl., was nearly 1,000,000 bbl. less than in May, 1933; cumulative production during the eleven months beginning July 1, 1933, was 57,077,354 bbl., about 5,250,000 bbl. less than for the same period in 1932-1933.

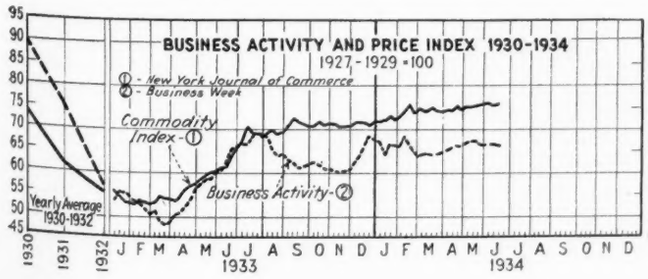
FERTILIZER SALES VOLUME during 1933 exceeded consumption during 1924-1928, it has been reported, largely on account of a 39 per cent increase in the sale of nitrogen.

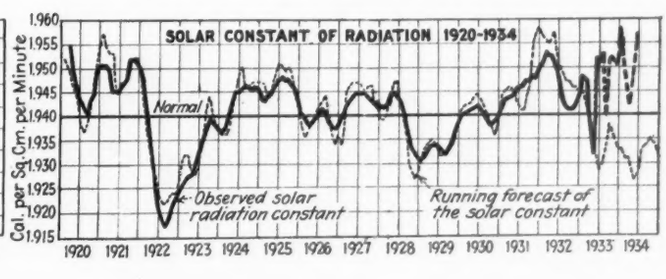
COLD-STORAGE HOLDINGS of American cheese on June 1 were 57,793,000 lb., about 16,400,000 lb. more than the year before and 11,200,000 lb. more than the five-year average for the same date.

CONSTRUCTION NEWS

	Pending (thousands)	Awarded June (thousands)	Total Awarded 1934 (thousands)
Bakery Products	$188	$17	$275
Beverages	2,527	665	5,786
Canning and Preserving	950	28	971
Confectionery	25	....	133
Grain Mill Products	347	....	2,967
Ice, Manufactured	....	....	58
Meats and Meat Products	119	....	256
Milk Products	305	214	1,249
Sugar	....	....	....
Miscellaneous	3,333	110	516
Total	$7,794	$1,034	$12,211


PRICE INDEX FOR FATS AND OILS
Index Number Aug. 1909-July 1914=100
Fats and oils
All farm products
1929 1930 1931 1932
J F M A M J J A S O N D J F M A M J J A S O N D
1933
1934


BUSINESS ACTIVITY AND PRICE INDEX 1930-1934
1927-1929=100
①-New York Journal of Commerce
②-Business Week
Commodity Index-①
Business Activity-②
Yearly Average 1930-1932
1930 1931 1932
J F M A M J J A S O N D J F M A M J J A S O N D
1933
1934


SOLAR CONSTANT OF RADIATION 1920-1934
Cal. per Sq. Cm. per Minute
Normal
Observed solar radiation constant
Running forecast of the solar constant
1920 1921 1922 1923 1924 1925 1926 1927 1928 1929 1930 1931 1932 1933 1934

NEW METHODS ...PACKAGES ...PRODUCTS

Almond-Stuffed Olives

An unusual delicacy of attractive appearance are Topmost Spanish Olives. Distributed by General Grocer Co., St. Louis, these are 90-100 size green olives stuffed with imported Spanish almonds, which are used on account of their large size. To pack this product successfully was not an easy matter. Some packers have tried using two almonds, but without success. And a troublesome factor was fermentation of the almonds after packing, which caused the cap to come off the jar. To prevent this, the nuts are processed in brine for about 30 days. Almond-stuffed olives cost about 15 per cent more to pack than those stuffed with pimentos. The liquor used is the same as that for any green olives.

Gas Treatment Reduces Decay of Oranges

Nitrogen trichloride gas effectively curtails the action of mold spores on navel oranges during storage and shipment. This has been shown in tests by California Fruit Growers' Exchange at Strathmore. Fruit was stored in two air-conditioned rooms, one being used as a control and the other for nitrogen trichloride applications. From Dec. 12 to the end of storage, Jan. 18, five applications of the gas were made, and there was a sixth treatment after the oranges had been loaded for shipment. The last treatment before loading was given to kill mold spores that had developed during storage, that these would not inoculate sound oranges during the dumping and packing. By the first part of January, the effect of the gas in the storage room had become pronounced, as indicated by the absence of mold on untreated objects.

To obtain another check, some of the oranges packed in boxes were held in the storage rooms and not shipped. At the end of 3½ weeks, decay amounted to 16.3 per cent in the boxes from the control room, but only 5.2 in those from the gas-treated one.

After the fruit loaded for shipment had reached New York, which required eleven days, it was held for ten days at 65 deg. F. and 65 per cent relative humidity. At that time the gas-treated fruit received an average price 8c. a box higher on the Sunkist brand and 3c. higher on the Red Ball variety than the fruit from the check room.

As the final phase of the test, unpacked boxes of the shipment were stored in air-conditioned rooms and inspected at the end of eight weeks. Of these, the oranges treated with nitrogen trichloride had a larger percentage of brown and black buttons than the control fruit. However, with adequate air circulation and close regulation of gas concentration, this trouble would have been eliminated, the report states.

Salad, Beets and Appetizer All Packed in Glass

Three delicatessen products in glass containers that attractively display the foods within will soon appear under the label of the newly formed Herco Foods, Inc., New York, N. Y. The three comestibles include potato salad, pickled beets and a sweet-and-sour appetizer.

In preparing the salad, the potatoes, after peeling, pitting and washing, are boiled in water slightly acidulated with vinegar. Then the product is precooled under forced draft and passed to the slicing operation. Workers manually mix the slices with the seasoning and mayonnaise mixture so that there may be no undue breakage.

After being washed and boiled, the beets for the pickled product are peeled, while warm, and cut to shape with dies. Onions sliced to about $\frac{3}{16}$ in., but not cooked, also go into this product. The two vegetables are mixed with a hot sugar-white vinegar solution.

Small onions, cauliflower, red and green peppers and dill pickles comprise the sweet-and-sour appetizer. The formula calls for soaking all these vegetables, except the dills, in a brine solution and then parboiling. All the ingredients are cut and sliced, being then mixed with a special mustard sauce.

All these Herco products are handfilled, evacuated and sterilized. None of them contains "preservatives" or artificial coloring.

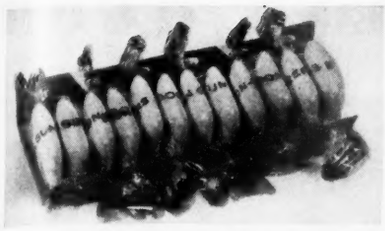
Looks Smaller but Sells

Although it appears to be smaller, the new peanut butter jar of Jewel Tea Co., Inc., Barrington, Ill., sells much faster than its predecessor. Shown at the left in the illustration, the new jar was designed to look well on the table and to make it easy to remove the contents down to the last bit. The rounded contour contributes both to appearance and to accessibility. The comparatively

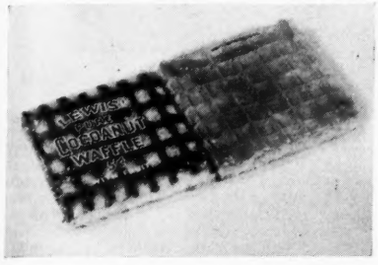
short depth and wide mouth also make it easy to get the product out. The label and cap were done in shades of brown so that they harmonize with the color of the product, and the label carries the consumption stimulating suggestion "It Tastes So Good."

The smaller appearance of the new jar is more than offset by its attractiveness and, more important, by the fact that it is not sold from the shelf, where it would be surrounded by other jars, but is placed in the hands of the housewife in her own kitchen. Another point in its favor is that it will take a Mason cap for home canning.

Jewel Tea reports that the sales of this item for the first eight weeks in 1934 tripled the sales of the same weeks in 1933.



Something different from the ordinary type of wrapper for coated chewing gum is being experimented with by Frank H. Fleer Corp., Philadelphia. The transparent cellulose wrapping is twisted around two pieces of gum so that the ends of the wrapper are flared. Six of these packages are held in a notched cardboard receptacle.



Cocoanut Waffle is an invention of Lewis Bros., Inc., Newark, N. J. It comprises a paste of cocoanut, pineapple core, corn syrup, flavoring and sugar. This is spread on a marble, where it cools and is cut and waffled. Then it is placed on a cracker and toasted.

Removable fillers protect the fragile contents of the cardboard boxes used by Nutt Bros. and Dolly Madison Cakes, Ltd., Los Angeles, for their bakery products.

A new idea in food advertising recently was put into use by Arbuckle Bros., New York, N. Y. A small stereopticon device is fastened to the top of a can, and when the shopper looks into the apparatus she sees pictures of the operations by which quality coffee is produced. A lever moves the film across the field of vision.

Stick candy with its "barber-pole" spirals tempts the sweet tooth quite strongly when neatly packaged in transparent cellulose. John G. Woodward & Co., Council Bluffs, Iowa, has adopted the transparent package for several varieties of its pure sugar stick confection. This package costs much less than glass jars.

Because a product like mustard, which does not vary from year to year, needs something novel to keep the customers' interest alive, Plochman & Harrison, 82-year-old Chicago packing firm, frequently adopts something new in the way of containers. The latest is "The Little Dutchman," the shape, label and closure of which effect the likeness of the character represented.

"Frenchy" in appearance, the glass container for Seidner's French dressing admirably suits the product. Furthermore, the black trimming and lettering on the jar combine attractively with the orange of the product. Otto Seidner, Inc., Westerly, R. I., packs the dressing.

Ultra-Violet Irradiation Adds Zest to Drinks

To make their carbonated beverages "zippier" and to endow them with therapeutic qualities, Sparkling Carbonic Co., Cincinnati, have put into practice ultra-violet irradiation of the CO_2 used in the drinks. Treated in the liquid state, the CO_2 passes through a container having a quartz window 1½ in. thick and capable of withstanding a pressure of 7,200 lb. per square inch. Ultra-violet rays pass steadily into this window, being generated by a high-powered, mercury-vapor lamp with a power consumption of 1,100 watts. Sparkling Carbonic Co. reports that tests have indicated the irradiated CO_2 to have a lower bacteria count, to be lighter and more active and to give the beverages a more palatable zest.

Silk-Sifted Flour

All-purpose flour of exceedingly fine texture, said to be even finer than cake flours, is a recent innovation by the 70-year old Durst Flour Corp., Dayton, Ohio. Worked out by E. G. Durst, Jr., the process consists of sifting the flour through a fine, imported, hand-woven silk cloth. The superfine texture of Silk-Sifted flour is an aid to baking bread, cake, pies and pastries of superior texture.

Half-Pint Ice Cream Plant

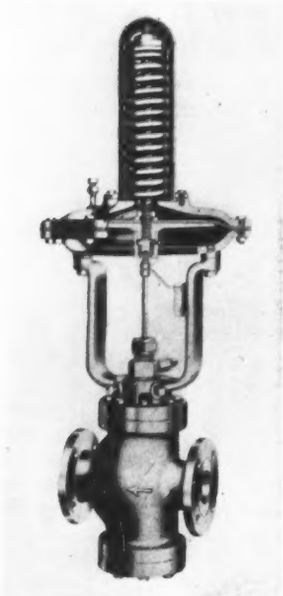
Employing a new method of freezing ice cream confections and slush drinks, a small machine has been introduced for store use which may increase the quantity of these products made at the point of consumption. Developed by E. E. Lindsey, Los Angeles, the machine produces almost any desired combination of flavors and colors of ice cream, frozen novelties and semi-frozen drinks in 15 to 45 seconds.

To make ice cream the mix is simply poured down a central hollow shaft where it is atomized by a spray spindle driven by a 1/64-hp. motor, being sprayed against the walls of the chamber, which are refrigerated to —20 deg. F. with methyl chloride. The shaft head travels up and down, driven by a 1/15-hp. motor, and as soon as the material has frozen sufficiently, a cutter head automatically removes it from the walls, molding and discharging it. This operation requires 30 to 45 seconds.

Frozen novelty confections can be produced almost as quickly. If the mix is poured in first and followed by fruit juice or fruit pulp, the finished product will be ice cream with a fruit core. These confections are free of disagreeable ice crystals and smooth in texture, because of atomization and instantaneous freezing.

Slush drinks may be made with this machine in 15 seconds.

NEW • EQUIPMENT • FOR

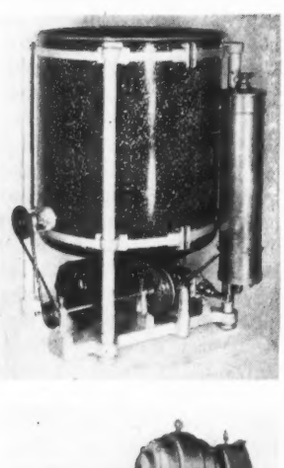


Reverses Design Of Motor Valve

Reversal of the diaphragm and spring in the "Stabilflow" valve developed by Foxboro Co., Foxboro, Mass., has resulted in its accurate response to the slight changes demanded by the control instrument, the manufacturer states. Smooth valve action is insured by the suspended construction of the valve motor, while a flow rangeability of 50 to 1 results from the valve-port construction, it is asserted. The absence of motor guides eliminates friction at that point, while the valve stem lubricator reduces stuffing-box friction as much as possible. The spring is inclosed in an air-tight chamber which protects it from corrosive action. Each valve is equipped with an index to show the position of the plunger and whether the valve is an air-opening or air-closing type.

Emulsifier

An emulsifier designed to be run with wide open gap or to be adjusted to produce results down to one-half micron has been marketed by Eppenbach, Inc., 45-10 Vernon Blvd., Long Island City, N. Y. The machine, type F of the maker's line, is equipped with a ½-hp., 110-volt universal motor, and has a capacity of 10 to 15 gal. per hour. Occupying a space 13x13x30 in., it weighs 72 lb. It is constructed of non-corrosive metals and all parts are interchangeable and replaceable. The emulsifier may be used for experimentation as well as for production.

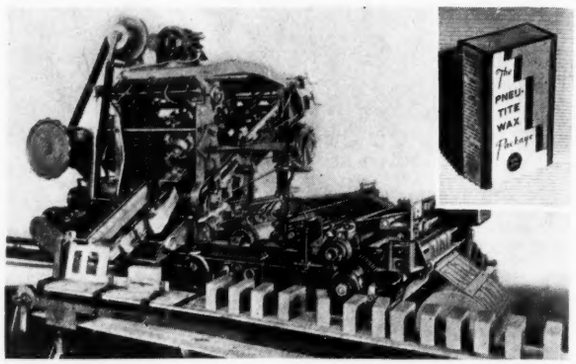


Syrup Mixer-Filter

By means of a two-way clutch which shifts the pulley drive from agitator to pump, the "Junior Series" combination syrup mixer and filter developed by Pfaudler Co., Rochester, N. Y., fulfills both operations included in its name. When the syrup has been completely mixed by the agitator, the tank outlet valve is opened. The two-way clutch is shifted to stop the agitator and start the pump, which forces the syrup through the filter and out through the product outlet. The combination mixer and filter, available in 50-, 75- and 100-gal. capacities, is made of steel lined with acid-resisting glass enamel and finished on the outside with black and white porcelain enamel. Either side- or bottom-propeller agitator and drive may be had.

Meat Grinders Have Two-Speed Motors

Two-speed motors, affording high speeds for beef and low speeds for pork grinding, are available features on the "Boss" grinders Nos. 451 and 452 announced by Cincinnati Butchers' Supply Corp., 1972 Central Ave., Cincinnati, Ohio. The grinders, made in two sizes, one for medium-size and the other for large-capacity plants, accommodate No. 166 knives and plates in the cast-steel cylinders. No. 451, shown in the accompanying illustration, accommodates 10- to 20-; No. 452, 15- to 40-hp. motors. Both may be had with an emergency safety ring encircling the hopper which will stop the motor and feed screw when held off its normal position; the feed screw will then turn in the reverse direction. As shown, there is a compartment in No. 451 for knives and plates, which may be hung on three steel pins. Knives and plates for No. 452 are hung on steel pins inserted into the cast-iron cover of the drive mechanism. No. 451 weighs from 2,500 to 3,080 lb.; No. 452, 3,125 to 3,625 lb.



Sterilizes Liquids With Silver

Sterilization and disinfection of water and other liquids is accomplished by means of the electro-katadyn process announced by Katadyn, Inc., 11 West 42d St., New York, N. Y. The process, based on oligodynamy (the ability of very small quantities of certain metals, particularly silver, to sterilize liquids, especially water), involves bringing traces of silver into solution by electrolysis with the aid of a very weak electric current flowing between two silver electrodes immersed in water. The katadynizing apparatus consists of pressure-resisting metallic vessels through which the water flows, lined with special insulation. The water flows past electrodes of shaped plate silver, the polarity of which is changed at prescribed intervals to avoid the formation of insulating coating. Drinking water has to complete its sterilization in a storage tank or pipe line, but disinfectant water may be used at once. The small unit shown is for portable use, and, after a 20-second immersion, produces pathogenic germ-free water in little more than an hour. Apparatus similar to the one shown is available for installation in dairy, packing, beverage and other food plants.

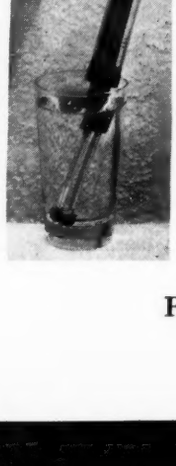
Machine Glues Wrapper to Carton

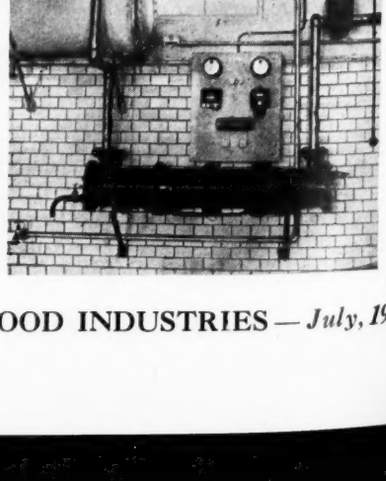
Moisture resistant, sift- and insect-proof packages, similar to the one in the accompanying illustration, are now possible by means of the tight-wrapping process developed by Pneumatic Scale Corp., Ltd., 59 Newport Ave., Norfolk Downs, Mass. The printed waxed wrapper is glued to the carton, and the ends are folded down over the corners and heat-sealed. The waxed wrappers are fed from printed rolls; cut to size; and controlled for register by an electric eye.

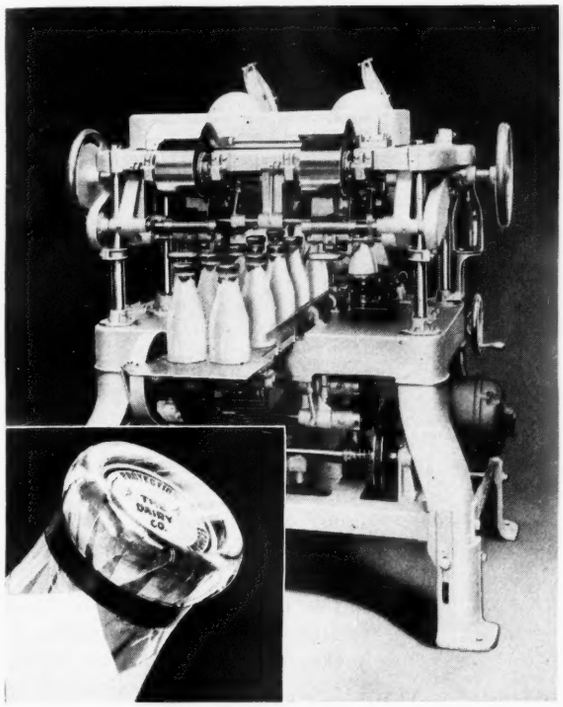
Aluminum Foil Seal For Milk Bottles

Two tamper-proof aluminum foil seals, closely akin to the first closure of the aluminum foil type for milk bottles, are being offered by Aluminum Co. of America, Pittsburgh, Pa. Like the first model, the newer seals are fitted to each bottle, but cover not only the pouring lip but also most of the finish, as shown in the illustration.

(The newer models are on the left and in the center.) The caps are blanked from a roll of foil, usually at the dairy, the cutting, forming, embossing and applying being continuous. They may be applied with cappers ranging from 25 to 140 bottles per minute in capacity. Embossing plates are interchangeable. To distinguish between grades of milk, the seals are supplied in colors in addition to aluminum and gold lacquer, if the user requests.





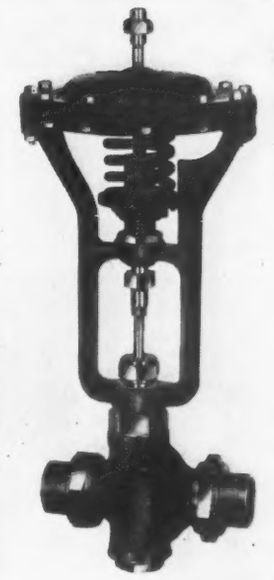


Hoods Milk Bottles With Cellophane

Sealing milk bottles with the Cellophane hood shown has been stepped up to 80 per minute with the improved machine by Package Machinery Co., Springfield, Mass. (see FOOD INDUSTRIES—March, 1933). The newer model is powered with a ¾-hp. motor and occupies 4x6½ ft. of floor space. The Cellophane, by DuPont Cellophane Co., New York, N. Y., now is said to be waterproof, and the Dennison tape used also is said to have been improved.

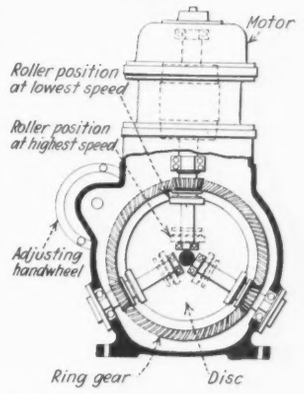
Synchro Motor Valve

Intended primarily for use in air-operated control systems, Bristol Co., Waterbury, Conn. is now offering its "Synchro" diaphragm motor valve, said to respond immediately to air-pressure changes. The stem position for a given pressure remains the same whether pressures are rising or falling. The construction of the valve not only prevents hysteresis and friction loss but also simplifies maintenance and servicing. Th top may be renewed or the spring replaced without changing the setting of the sprin follower. Union and valve bodies of either V-port or single-seated construction are available up to 2 in. in size for 250 lb. maximum steam pressure.



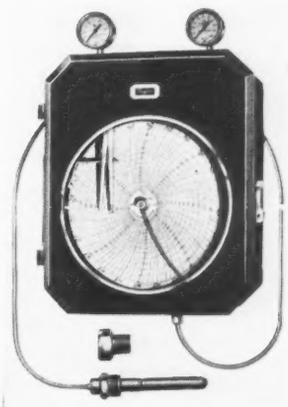
Speed Variator Uses Roller Traction

An infinite number of speeds within the range of 3:1 are obtainable with the Stanley speed variator, manufactured by Merritt Engineering & Sales Co., Inc., Lockport, N. Y., in capacities from 2 to 20 hp. It is built on the roller-traction principle by which locomotives travel, with three pairs of driving rollers positively driven by an integrally built-in motor. A pair of disks connected to the output shaft are driven by contact with the pairs of rollers. When the rollers are shifted one way or the other on their driving shafts, the effective diameter of the driven disks is changed, thus effecting a variation in speed. Construction details are apparent from the diagram shown.



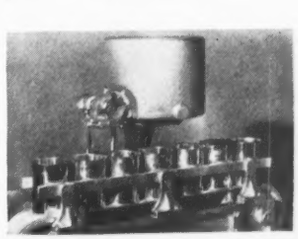
Recording Regulator Easily Adjusted

Simple screwdriver adjustment on a graduated dial allows throttling or on-and-off diaphragm valve action, according to the type of control desired, with the "Fulscope" recording regulator, manufactured by Taylor Instrument Cos., Rochester, N. Y. Thus, regulator performance is balanced against any degree of apparatus time lag, it is said. An added advantage, states the maker, is that the mechanism and means of adjustment are the same whether used for controlling temperature, pressure, rate of flow or liquid level, the only difference being in the means of actuation. The standard regulator has a duralumin mechanism, a die-cast aluminum case either for face- or flush-mounting, and an electric chart-driving mechanism.



Dispenser Feeds Salt to Cans

To feed a given quantity of bulk salt into a can, A. K. Robins & Co., Inc., Lombard and Concord Sts., Baltimore, Md., has developed the Hume salt dispenser. Feeding by the no-can, no-fill method either into the empty or into the filled can, the dispenser handles up to 100 cans per minute. The standard model takes sizes up to and including No. 3, while the special type takes the No. 10; by means of attachments, salt may be fed into more than one size can in the line. The salt container is made of non-corrosive aluminum and is fitted with a steam jacket to keep the salt warm and dry. A separate feeding attachment is used for each size can.



The Manufacturers ••Offer••

Insulation — For furnaces at temperatures up to 1,900 deg. F. Johns-Manville, 22 East 40th St., New York, N. Y. Folder In-28-A; illustrated.

Handling and Storage — Lift-trucks, platforms and racks. Barrett-Cravens Co., 3260 West 30th St., Chicago, Ill. Bulletins Nos. 126 and 402; illustrated.

Milling—Flour- and feed-mill machinery. Forster Manufacturing Co., Inc., 471 North Seneca St., Wichita, Kan. Catalog No. 101, 6 pp.; illustrated.

Closure — The "Westite," for collapsible tubes. F. J. Stokes Machine Co., Tabor Road, Olney P.O., Philadelphia, Pa. Bulletin 34-H, 10 pp.; well illustrated.

Fluids—Proportional processing with the "Tret-O-Unit." Proportioners, 15 Codding St., Providence, R. I. Booklet, 7 pp.; illustrated.

Belts — "Short Cuts to Power Transmission." Flexible Steel Lacing Co., 4607 Washington St., Chicago, Ill. Booklet, 72 pp.; well illustrated. Discusses many phases of the subject. Includes appendix of useful information.

Agitator—The horizontal and vertical "Unipower." Patterson Foundry & Machine Co., East Liverpool, Ohio. Illustrated folder.

Self-Protecting Motor—"Linc-Weld," protected from burnouts. Lincoln Electric Co., Cleveland, Ohio. Illustrated folder.

Firing—By the automatic underfeed method. Link-Belt Co., 2410 West 18th St., Chicago, Ill. Booklet, 22 pp.; well illustrated.

Fuel System—Ball mills and burners for pulverized coal or coke. Foster-Wheeler Corp., 165 Broadway, New York, N. Y. Bulletin P-34-2, 24 pp.; very well illustrated.

Switches—Type R, for instruments and control. Roller-Smith Co., 233 Broadway, New York, N. Y. Catalog No. 9, 7 pp.; many connection diagrams.

Corn Products—Processing as done in the Clinton Co. plant, Clinton, Iowa. Booklet, 63 pp.; very well illustrated.

Insulated Cable—Its selection for industrial use. General Electric Co., Schenectady, N. Y. Booklet GEA-1837, 78 pp.; illustrated. Describes various types of insulation and finish, and furnishes tables of wire gages and dimensions, sizes of shipping reels, and a bibliography.

Motors — Squirrel-cage induction type. Allis-Chalmers Mfg. Co., Milwaukee, Wis. Leaflet No. 2173; illustrated.

Storage Beetles Are Among Worst Pests

(Concluded from page 317)

should be selected in favor of the material treated (Formulas Nos. 8 and 9*). Finished food products that are infested should be destroyed.

Carpet, hide-and-tallow, larder, and carrion beetles feed almost entirely on either moist or dried animal products and are often quite common as well as destructive wherever these materials are handled. Like the preceding group, they are cosmopolitan and prefer long-stored articles to breed in.

The hide-and-tallow beetles vary from $\frac{3}{16}$ to $\frac{5}{16}$ in. long, are black on top and whitish beneath, hard, robust, and fairly active. They feed on the softer forms of animal matter, such as tallow, raw hides and carrion.

The larder beetle is about $\frac{1}{4}$ in. long, black on top and yellow beneath, hard, robust, and fairly active. It usually is more of a pest on cured meats, such as hams and bacon.

The carrion beetle is about $\frac{5}{16}$ in. long, hard, black marked with white on top and mostly white beneath. It is fairly active. Its feeding habits are similar to the hide-and-tallow beetle.

Control measures are in general the same as for the preceding group except wherein the material may require a more specific method.

There are several varieties in the spider-beetle group. They resemble spiders in several ways, hence their common name. They are insects, however, and have only the regulation six legs. They vary in size from very small to over $\frac{1}{8}$ in. in length, and in color from yellowish to reddish brown, are somewhat globular in shape, hard and usually not very active. They feed on various dried plant and animal products in storage, such as wool, hair, leather, roots, seeds, cereals, and the like. In warehouses they are frequently found in wall cracks near the floor, but, as they breed rapidly when conditions are right, they may occasionally cause serious damage.

Control measures for these pests are essentially the same as for the preceding two groups.

The ham beetle is now generally considered more of a parasite on other insects than a destructive pest. It is found mostly in spoiled meats, fish or cheese, although it is occasionally encountered on seemingly good cured meats. Both the adults and their larvae are supposed to feed on the various other insects that attack these foods. These beetles are frequently encountered in large numbers also on incoming shipments of copra. They are nearly $\frac{1}{4}$ in. long, of a shiny green or steel blue color with red legs, somewhat slender and flattened, medium hard, and quite active. The larvae are about $\frac{3}{8}$ in. long, of a light brown color with darker heads, soft, hairy, and fairly active. Control measures for the ham beetle should be determined more by the type of material they are in or by the necessity of removing the other pests that have attracted them.

The cadelle is a common pest in many food plants. The adult is

White-marked spider beetle

about $\frac{3}{8}$ in. long, shiny black, hard, quite flat, and active. The larvae are about $\frac{1}{2}$ in. long, pink, white or yellow in color, soft, flat, and quite active. Both stages attack cereals and cereal products as well as several nut meats, and frequently do much damage. They favor long-stored materials.

Except nut meats, the materials affected by this pest are not ordinarily held in cold storage, therefore frequent inspection and general cleanliness should be the principal features of control. Infested materials should be destroyed in most instances, but in any case the containers should be thoroughly sprayed or the entire room should be fumigated.

The adult meal-worm beetle is about $\frac{9}{16}$ in. long, rather flat, a shiny black or brown, hard, flat, and quite active (similar to the cadelle except larger).

The larvae (worm-like form) is about 1 in. long when full grown, slender, and is then a shiny yellow or brown, round on top, flat beneath, hard, and quite slow and awkward.

Both forms occasionally prove very serious pests in cereals, cereal products and seeds, and are frequently found in cracks, corners, dust piles, and other neglected spots where cereal products may form a part.

Control measures should be the same as recommended for the cadelle.

The fungus beetle is about $\frac{1}{8}$ in. long, fairly robust, reddish brown, with two black strips across the top. It is seldom destructive to stored materials but is frequently found in damp cellars and in refuse cereals, feeding upon fungus and the fermenting materials.

The pest usually can be satisfactorily controlled by general cleanliness. To dispose of an infestation already established, follow the recommendations given for the cadelle.

American Cheese in Cans

(Concluded from page 309)

be protected from heat. Cheese properly made and well ripened will stand more heat without becoming oily than green cheese, but any cheese exposed to high temperatures will become unsightly on account of fat exudation.

Certain other types of cheese may be canned, but many of the more popular varieties must be ripened in the established style of loaf to have the characteristic appearance and flavor. Roquefort, wrapped in foil, may be sealed in cans after the mold has fully developed. As the cheese, after this stage, is stored at a low temperature, it probably is not necessary to use a valve. A half-size Roquefort—that is, 2 to $2\frac{1}{4}$ lb.—makes a very satisfactory package when canned for the smaller dealer or even for the consumer. Swiss cheese, which must be ripened in the usual large wheels to secure the proper eye formation, may be cut in any desired size and canned, but this involves so much waste that it cannot be considered practical. Many other cheeses which ripen quickly and deteriorate after they have passed the optimum stage of ripeness are not suited to canning.